THE VETERINARY JOURNAL

AND

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THE WILES OF THE ADVERTISING AGENT AND HIS NEWSPAPER.

ADVERTISING is an insidious disease, and it seems to be eating its way into the vital organs of the nation. Even journalists complain bitterly of its aggressions; they sigh as they see the counting-house gradually asserting an unwarranted supremacy over the editorial room, and they wonder how long this is to continue, or how far it is to be allowed to go. Gradually our pictorial newspapers are becoming mere sheets of advertisements, with more or less ugly and irritating pictures, plus a few drawings and a few amusing paragraphs winding like arabesques round the announcements which proclaim the virtues of Smith's soap or Brown's whisky. The latest development of the craze is slightly amusing. The proprietor of the *Stable and Kennel* is a philanthropist who wishes to bring about harmonious relations between the veterinary profession and the public. He is sorry we are so modest and so diffident, and he thinks such virtues as we have should not be hidden. Then, in addition, he wishes to benefit the great horse-owning and cattle-breeding public and that greater section of our people which enjoys the higher forms of sport and likes country life. His plan is this: he proposes to keep a "select register" of veterinary surgeons practising everywhere in Great Britain and Ireland. The list, we presume, will be printed with every number of his journal, and will contain the names of such veterinary surgeons as apply for admission. Thus, if a country gentleman, say in Fife or Northumberland, wishes to buy a horse in Rugby or Leicester, or a dog in some Cheshire town, he will simply

turn to his last number of *Stable and Kennel* and get the name of a favoured veterinary surgeon in these towns, to whom he at once trusts this delicate and troublesome commission. But this is not all. Veterinary surgeons are not only to be advertised gratuitously—a payment would be so vulgar, and would, moreover, bring the delinquent under the lash of the R.C.V.S.—but he is actually to be rewarded, not exactly for allowing his name to appear in the register, but for notes and articles which he may send to the editor—when they are accepted. This sounds rather nice, and quite like a tale from Fairyland. But it is a little too ingenious. The proprietor of *S. and K.* must come in somewhere, for even philanthropists must live: their butcher and baker seldom take the same views of life as they do, and are rarely so philanthropic as to do without payment of their accounts. Well, in the first place, it is quite clear that every veterinary surgeon thus advertised will buy, from sheer gratitude, a copy of the new country gentleman's paper every week, although of course his plea will be his desire to see merely that his name is correctly printed. Then again, when his article appears—and it is quite possible that such things will occur occasionally, for decency's sake—how many copies will not that happy surgeon buy to send to his friends and admirers at home and abroad! Won't he proclaim the virtues of the new journal—run upon philanthropic principles, mind you, too—all through his district! Whatever the proprietor asks in the way of information regarding possible purchasers of the paper will be supplied with swiftness and alacrity, and the worthy veterinary surgeon will never see that he gives more than he gets in the long run. We should like to know how contributions will be paid, and we should like to have a look at the yearly accounts of the journal and see how the balance of profit lies: we fear it will not be on the right side of our professional brethren's account.

But there is another aspect of this question, and a very serious one. Are we, as a body, going to allow a mere mercantile venture to, as it were, catalogue us—and that imperfectly—and sell us to the public? This advertising trick seems to us about the most impertinent interference with professional etiquette and professional morality that could well be imagined. Some members of the profession will say "Let it alone: the whole scheme will collapse through its own inherent feebleness and absurdity; the public will at once suspect the motives of the

newspaper proprietor in printing these names, will be pretty certain that they are in one form or other mere paid advertisements; and the wiser part of the public knows that advice given for nothing is generally worth just that amount. Men who possess valuable live-stock know that honourable veterinary surgeons—men of character and great professional skill—will not, need not, dare not, advertise themselves even covertly, and they will come to see that only needy men, of poor attainments, will adopt such means of proclaiming their existence, a proclamation which causes them, besides, to run the risk of a severe reprimand from the Royal College." But we must not rush to such hasty conclusions, or place too much dependence upon the wisdom and acuteness of our fellow-countrymen. We need not go so far as Carlyle, and say that they are "mostly fools," but we must remember that the general public is mostly lazy and always easily impressed with appearances. How will it be possible to teach the ordinary man that the *Stable and Kennel* list is no official list, and carries with it no guarantee, but perhaps the reverse? He will learn by experience that this is true—it may be after an unpleasant encounter with an incompetent man—but then, finding (as he will find) that he has no legal recourse against the newspaper, and that he has only himself to blame for employing a complete stranger, he will vent his rage against the veterinary profession at large, and include us all, good and bad, in his condemnation. This may do us incalculable harm if two or three times repeated, and we cannot afford that anyone should be allowed to tamper with our reputation. It is not surprising that the newspaper people should try to extend their circulation by every means in their power, only we veterinary men should not allow ourselves, under whatsoever pretence, to be made their tools or their dupes. Had the proprietor or business manager of *Stable and Kennel* asked leave of the Royal College to print a complete list of veterinary surgeons practising in the country, with their addresses and dates of diplomas, the matter might possibly have been arranged, only this would obviously not have suited the newspaper purpose. We are strongly of opinion that an edict should go forth from the Royal College strictly forbidding this covert form of advertising and threatening penalties to all members who disobey. We trust that what we have said and the arguments we have used will justify our demand for the maintenance of severe discipline.

MEAT INSPECTION AND THE SANITARY INSTITUTE.

THE *Veterinary Record* seems surprised that the profession is not satisfied with the proposed certificate of the Sanitary Institute, and argues the matter in a rather half-hearted way. Perhaps the editor is honestly anxious to please both parties, but, like all waverers, he succeeds in pleasing neither, and only incurs odium, or at least distrust, for himself. We prefer a vigorous policy, even at the risk of being thought fanatical. "The boldest conduct," says Mr. Froude, "is generally the safest." We think it much wiser and manlier to put forward, in a plain, blunt way, the claim of veterinary surgeons as being the *only* fit and suitable persons to undertake the inspection in question. And, indeed, how can it be otherwise? We claim to be specialists in this matter, and we have asked the Government to recognise our claim to be such, and we have obtained this recognition in the form of Royal Charters. What will the nation think of us, what will the Government and the Crown think of us, if we do not valiantly assert our rights and show ourselves worthy of our privileges? The *Record* seems to hint that we are not worthy of these privileges, and are not prepared for the extended duties, but this is not true, and, even if it were true, we must not admit it; we must work up to the position and capture it, or perish in the effort. This is, I maintain, a critical period for the veterinary profession; we are clearly on our trial, and we must show the stuff we are made of. The *Record* need not be afraid: we have plenty of enemies and plenty of slanderers who will do their worst for us, and seek to reduce our claims. They will disparage us in every possible way, and it may be that we shall have to admit such modifications in matters of detail as the Government may suggest—for example, the institution of a post-graduate course, entailing a post-graduate degree. But this is for the future.

Why does not the editor of the *Record* show that he has the courage of his own opinions? "We believe," he says, "that no other training than that given to veterinarians can make a man thoroughly fit to inspect dairies, and all live and dead animals intended for human consumption." Of course, and neither does any other veterinary surgeon or veterinary editor or writer, who is worth his salt. "*Le succès fut toujours l'enfant de l'audace*," said a wise Frenchman, and I commend the phrase to the editor of the *Record*. Let him adhere to his own words and allow the other side to bring forward the opposite argument, if they can.

But the *Record* goes on to say, rather weakly, "We hope that when the Public Health Acts are consolidated and amended" (let us hope the amendment will come before the consolidation!) "practical recognition of the veterinarian's claims will be made." One might as well say, "We hope that our excellent police staff will recover the steed for us when it is stolen; we trust and admire our police, and will give clear proof of our confidence and admiration—we will not lock the door of our stable at night, but will slumber gently and peacefully, knowing that all is well."

The *Record* has evidently the fear of a Government Board before its eyes, and timidly suggests a few difficulties to be encountered by the deputationists. These gentlemen may be asked, for example, if they think that all veterinary surgeons are capable meat inspectors. This is an easy enough question to answer. Veterinary practitioners are not all heaven-born meat inspectors; many have to acquire their knowledge slowly and painfully. Some of them, perhaps, whilst excellent surgeons, may have neither the special talent nor the inclination to become meat inspectors, but these men will not apply for the posts; for the rest the answer is supplied by the *Record* itself: "No other training than that given to veterinarians can make a man thoroughly fit to inspect, etc., etc." In a word, every veterinarian is not necessarily an inspector, but every inspector ought to be a veterinarian, just as we might say, no one can speak correct and fluent English but an Englishman, but every Englishman does not talk the best and most fluent English. The other trouble suggested by the *Record* is, "Whether no one among the present lay and medical inspectors can have arrived at proficiency after a life-time spent at the work." Far be it from me to suggest that no one who has not gone through the veterinary curriculum is fit to be an inspector. There may be heaven-born meat inspectors who have, as an old friend of mine used to say, never smelt college air, but the difficulty is to find them and make sure of their capabilities. There is plenty of gold in the world that has not been turned into coin, but how many are there amongst us who can tell the pure metal? Yet we recognise the sovereign easily enough and will gladly give twenty shillings in exchange. For the rest of the argument see the *Record, ut supra.*

It seems rather superfluous to follow the *Record* farther in its tortuous course. "There are," says the editor, "some 400 local authorities in the kingdom, each with its sanitary inspector, on whom the law throws the duty of inspecting

meat. Of course (!) such inspection is a farce, but it is better than nothing." Is the editor quite serious? For "farce" one might read "sham," or go a little farther and read "lie" without injuring the sense of the passage; indeed, one might thus strengthen and vivify it. Now who will maintain that falsehood is better than truth, or better even than a total absence of fact or statement? Surely only the coward or the thief. Far better have a barren and deserted field than a crop of noisome weeds that will take years to eradicate —that can never be wholly eradicated. What has become of the *Record's* morality—nay, of its logic and common sense?

The next sentence is even feebler and punier. "So long as the law permits this state of things, it is well that some attempt should be made, even if only a little one, to improve the knowledge of the inspectors" (the *Record* means the lay inspectors). This sounds almost like an appeal *ad misericordiam*, and reminds one of the story of Lot when he was told to hasten away from the wicked cities of the Plain. We really must take the editor of the *Record* by the arm, and try to put some kind of stiffening into him. No, no, sir; we want no little attempts, we will listen to no whining appeals—we want heroic measures. Take your own argument, already quoted, and stand manfully by it: therein lies your only safety.

As for the statement that the medical profession has acted the demure and humble part, I utterly deny it. The medicals have—and quite right too—jealously guarded their privileges and asserted their rights on all occasions and at all costs. It seems to me that the *Record* is mixing things up somehow, and I will therefore once more clearly state my position, which is this: the inspection of flesh-food and milk and the corresponding inspection of the domestic animals whilst in life, and of their places of abode, is a matter of great and vital importance to the community, as affecting most seriously the life and happiness of the community; such inspection ought to be entrusted only to specialists, that is, to men who have joined to natural taste and capacity special study and experience: veterinarians are the body from whom, on account of their training, such specialists can be drawn in the greatest numbers; if proper inducements are given, veterinarians will perfect themselves in greater numbers than at present, so as to show themselves worthy of the nation's trust; they must not be hampered with baser duties, such as the inspection of ash-pits and water-closets, which would militate against their higher duties and indeed endanger the

execution of them; such baser duties must be entrusted to another class of men, who may be called on, if occasion requires, to act as adjutants to the veterinary inspector; but the tendency must be rather to associate the medical and the veterinary inspectors than the veterinary inspector and the mere inspector of nuisances. To bracket the flesh-food supply of the country with nuisances is to my mind nothing less than monstrous. The nation must surely see this for itself and hasten to aid us in our pious endeavours. We may then, perhaps, hope for the support of the *Record*.

THE BOARD OF AGRICULTURE AND INVESTIGATIONS OF OUTBREAKS OF CONTAGIOUS DISEASES AMONGST ANIMALS.

We have received a letter from a correspondent complaining of the method at present adopted by the Board of Agriculture in connection with investigations of outbreaks of contagious diseases amongst animals. In the particular instance adduced by our correspondent, the recent reappearance of rabies in Wales was quoted, and it was pointed out that Captain MacIlwaine, R N., who was sent by the Board to investigate the matter, has no scientific veterinary knowledge. He appears to have been unaccompanied by an expert. The subject has excited a good deal of attention and comment in the veterinary periodicals during the past few years, and it certainly does seem to us illogical that outbreaks of contagious disease amongst animals should be investigated by men who have no special qualifications for the task. The position is about on a par with that at present in vogue in many of our large towns, whereby inspectors of animal flesh intended for human food are chosen from amongst plumbers, masons, and omnibus conductors. But because the position is not unique it is none the less an anomalous one. It is not so very long ago that the Government had a properly organised veterinary department with a veterinary surgeon at the head. Under its control cattle-plague, foot-and-mouth disease, and pleuro-pneumonia—three great scourges of the bovine race and sources of enormous annual loss to agriculturists and dairymen—disappeared permanently. Contrast with it the present state of affairs. The title "Animals" has been substituted for "Veterinary" department, a proceeding which has given much umbrage to the members of the veterinary profession, and an ex-army officer

has been placed at the head instead of a properly qualified expert. The results have been only too obvious in the case of swine fever, where nothing but failure can be reported, while the delay caused by unnecessary red tape procedures favours the spread of the disease before any efficient action is taken. The travelling non-veterinary inspector is not out of place where no diagnosis has to be made, for he is fully capable of seeing that proper disinfection and modes of burial are carried out, but to send him in the first instance to investigate and advise regarding an outbreak of disease (as appears to have been done in the case referred to by our correspondent) is clearly putting him in a false position. Here the services of a veterinary surgeon surely are required. —*The Lancet, September 30th*, 1899.

BOROUGH VETERINARY SURGEON.

At a recent meeting of the Scarboro' Sanitary and Lighting Committee, Mr. Jas. Cooke, F.R.C.V.S., Elder House, Elders Street, was appointed borough veterinary surgeon and consulting meat inspector at a salary of £120 per annum.

Opening of Colleges.

THE ROYAL (LONDON) VETERINARY COLLEGE.

THE winter session commenced on Monday, October 2nd, when the introductory address was delivered by Professor Sims Woodhead, of Cambridge. Colonel Duck, C.B., Director-General of the Army Veterinary Department, occupied the chair, and there was the usual large gathering of veterinary surgeons and others.

Professor WOODHEAD said :—

My one claim on you for a consideration of my words must be that I can approach the question from an outside standpoint, and that at no point can merely personal interest (in the professional sense) come in to bias my judgment. In saying what I have to say I speak merely for the honour of our science, for though our patients are not the same and our methods may in certain features differ, the principles which underlie the prevention, diagnosis, and treatment of disease—whether in man or beast—are essentially and fundamentally the same ; this may be seen in the approximation of our methods during the advancement of the knowledge of disease. It has sometimes been said that the medical man who has to diagnose and treat disease in the human subject enjoys great advantages over the veterinary surgeon, who has to treat a patient unable to express in words the pains and symptoms that oppress

him. Now, is this really the case? As we get to know more of disease we gradually come more and more to minimise the importance of subjective phenomena, and to rely more fully on accurate physical diagnostic methods. The physician who has to treat the young child is in the same position as the veterinary surgeon, but if we refer to the literature of medicine we shall find that in no department have greater advances been made, and diagnostic methods been better applied, than in children's diseases, and our best physicians are those whose early training has consisted largely in the diagnosis and treatment of disease in children—they are more self-reliant, more accurate, and have a wider knowledge of those small but important points from which inferences may be drawn than are those who have had no such training; the man who relies upon the so-called subjective phenomena of disease has usually a tendency to carelessness, and to accept and treat symptoms in place of finding out the pathological lesions upon a knowledge of which only can any permanently successful diagnosis be made and treatment be carried out. Gentlemen, from the scientific and practical point of view you have the advantage; you must answer your own questions to the patient, you are thrown on your own resources, and must rely on your mother wit, trained or untrained. To you the thermometer, the sphygmograph, the microscope, and the test tube are not merely playthings or for outside display. The results obtained from them along with your observations will be the only foundation on which you can build, and it is for this reason I say that you, as a scientific profession, have the advantage over us. Such being the case, whilst here you should avail yourselves of every opportunity of fitting yourselves to do your life's work scientifically and accurately. You are not here merely to learn routine work; you are here to be trained in scientific methods, to learn how to handle patients, the principles of your practice and the principles of treatment—not to go out into the world with heads crammed full of statistics and details, but with a knowledge of how to observe, how to reason on your observations, to find out what the conditions of disease are, and what inferences as regards treatment you must draw when your observations are complete. You must interpret, not remember, statistics; you must compile and reason from them, but do not be mere receptacles for them. Then, with regard to the physical signs of disease, you should be able to picture in your mind the pathological processes that their presence indicates. It is your work by the use of those signs and symptoms to draw such a picture, and to be able to determine the probable further course of the disease and how to effect, if possible, its abatement.

Professor Woodhead then gave as an example a case of pneumonia, a simple one, but one which showed how inter-dependent organs and processes are upon one another, and how necessary it is that the whole history of a disease should be taken into consideration when it is being diagnosed and treated. He showed very clearly that not only the lungs but the liver and the heart muscle also had been poisoned. Continuing, he said:—

The man who knows this when he goes into practice knows how to safeguard the interests of his clients. He points out how the digestive processes associated with the functions of the liver are going on but feebly, and diets his patient accordingly; how the heart is weaker than usual, and so rests his patient and regulates its exercise to allow of a gradual restoration of strength before he puts any strain upon the heart muscle that would do it damage. I wish to point out that if a man will attend carefully to his instruction in the college he will gather knowledge in a week which may be as valuable as years of experience, and he will start his professional life with principles which will enable him to commence where his predecessors have left off. Whilst you are studying here I beg of you to follow most closely the teaching of your professors. Each one of you must be quite prepared to

find, when you come to look into matters for yourself, that you will not always be in agreement with some of the teaching now given by the professors, and this for two reasons—first, because by that time new light may have been shed on the subject, new light from various sources by means of which most of what is now a deep shadow may be more fully illuminated. Secondly, because you must necessarily develop some individuality and some original mode of looking at the subjects in which your life's-work and interest lie. You will contribute some epoch-making discovery which you may say is all your own, but which the world will say you shared with those teachers whose knowledge you may imagine you are superseding. Professor Woodhead then pointed out that this difference of opinion should never be allowed to encourage a single thought of disparagement of the learning and accuracy of their teachers, and insisted strongly on the necessity of first acquiring at college a sure foundation on which to commence to build up the superstructure of a life's work; he pointed out that the principles offered them were the outcome of the experience of many generations of workers and teachers. As a further example of the differences of opinion that might arise, and the almost kaleidoscopic change of knowledge, he said:—

In recent years Metchnikoff by his brilliant work on phagocytosis has drawn attention to one of the processes observed in inflammation in such a manner as to make some people believe that phagocytosis and inflammation are practically convertible terms. If you read the recent literature on the subject of inflammation you will be astonished to find that in all probability your Principal—I ask his pardon for using this illustration—will devote perhaps less than one-sixth of the whole of his lectures on inflammation to phagocytosis. If you think too much more yourself (I mean in the conceited sense) at this period, you will wonder why this great present day question of phagocytosis does not receive more attention. If, however, you will keep your thoughts to yourself until the lectures are completed you will probably never express them at all, for you will find that since John Hunter's day and since Waller, Wharton, Jones, and Cohnheim made their wonderful contributions to our knowledge of the behaviour of the white blood corpuscles in their passage from the blood vessels into the surrounding tissues, slight additions to our knowledge of the subject have from time to time been added. Cohnheim's foundation was so sure that although these additions have filled in gaps, little or no essential modification of the work which he did has been necessary or even possible. Now your professor knows all this; he has passed through the mill of his reading and experience, and as the result he has been able to select what is worth studying, to lay stress on important points, to build up as it were for you a picture of the processes of inflammation which will serve as a basis for your future work and which you yourselves could only have arrived at after years of careful study. It is well that those who make new observations and start new theories should be enthusiastic—shall I say a little over-sanguine or even one-sided? The things which are near to us and which we study most thoroughly and carefully are apt to block out from our view other important, perhaps more important, matters. When we come to matters scientific our knowledge of the perspective is *nil*, and takes a long time for us to acquire an accurate working knowledge of. Until that is acquired it is well for us to trust those who have given their lives to its study. Remember, moreover, that you will be assailed by men from all sides who have worked carefully, each in his own little patch of ground, who will tell you that the products of his garden are the only ones worth gathering. Do not believe them. Accept what each has to bring, put it through the mill as you have learned from your professors to do, and then add it to your store of knowledge, fit it into its proper place in the scheme that you desire for your mental discipline, or if you find it worthless throw it aside altogether. We

have seen that in inflammation certain people tell you that phagocytosis is everything; others that without chemotaxis there could be no inflammation; others that damage to the tissues is an essential; and others that only when you have process of proliferation and repair can there be inflammation. You will find that all these factors enter into the question. Each has its importance and plays its part, but you cannot say that any one is all-important in itself or even as a necessary part. The exaggerated importance given to each factor arises out of the fact that many of the processes have been studied on simple protoplasmic bodies in which as yet there is but little specialisation of function. It is assumed that because certain amœboid cells, or even organisms slightly more specialised, behave in a certain fashion when they are exposed to the action of irritants, therefore cells which in the higher animals have a similar appearance, and perhaps also to a certain extent similar functions, must do exactly the same thing when they are irritated. That is only a half truth, but it has so specious an appearance of whole truth that it may deceive the unwary. It must be held that inflammation occurring in the higher or more specialised and complex animals is necessarily a far more complex process than it can be in the less specialised form of animal life. Indeed, in the less specialised animal we can scarcely expect to find more than a very small part of the process which we recognise as inflammation in the higher animals, all of which have well developed blood vessels. In these vessels are coursing red and white blood corpuscles suspended in a fluid of different composition. Around these vessels are tissues of various kinds (muscle, nerve, etc.), and in all of them are channels and connective tissue-cells and spaces. All these have to be nourished, all are the subject of various kinds of stimulation, all have to get rid of effete matter, and any or all of them may at any time be impaired. Even under normal conditions dead tissue has to be got rid of, whilst much more is this the case when tissues are injured mechanically, chemically, or the like, and new tissue or some substitute has to be developed to take the place of that which was lost. In certain of the simpler cells many of these processes, normal and abnormal, may be seen going on, and sometimes we think we understand how they go on, but in the more complex animals in which we have to study these processes we can only guess at the modes in which such processes are carried on, we cannot see any of them. We may know something of the actual resulting product, but beyond that, learnedly as we may talk, our real knowledge is still very scanty. Certain processes that are observed in inflammation of the higher animals, then, so far as we can determine by our observation and analysis of results, are seen to be analogous to certain of the processes observed in simple animals and cells, but it would be a dangerous matter to conclude that the part, or even collection of parts, seen in the lower organism is equal to the whole of the complex process of inflammation as presented in the more highly developed organism. The vessels, then, with their red and white cells, these latter of various form and function, give us something quite different from anything that occurs in the non-vascular animals. One of the essentials of acute inflammation is a process of hæmorrhage outwards into the surrounding spaces or tissues, first of the fluid in the vessels and blood plasma, and secondly of the various colourless and red blood corpuscles, the former not only giving rise to the round-cell infiltration that we see, but in all probability along with the minute blood platelets breaking down to combine with certain elements of the blood plasma to form fibrin. Here, then, we have a something which does not, as far as we are aware, occur in the lower forms of animal life. Beyond this, however, we have a series of proliferative changes which are so widespread in inflammation and can be so readily watched that they are well worth careful consideration. Not only do the wandering cells or leucocytes proliferate, but in a much more marked degree the fixed cells

that enter into the constructive process of building up connective tissue, whilst there may also be seen distinct enlargement and then proliferation of the specialised cells composing the endothelial lining of the blood and lymphatic vessels. In addition we have the changes that take place in the more fully specialised tissues, so that it may be gathered that inflammation, however fundamentally simple it may be, is an enormously complicated process when it comes to us, and not to be studied in any one of its branches alone. This, gentlemen, is a single example, but you will find that the same truth holds good whatever branch or part of your professional study attracts your attention and demands the expenditure of your brain energy in its study.

Professor Woodhead then commented on the advantages of a preliminary training, not obligatory in the case of their predecessors, and, in referring to the outstanding men of to-day, said that the average power of the profession had never been so great as it was to-day, since the standard of preliminary education had been raised. With reference to its being a mistake to ask for such a high standard of scientific knowledge from the man who was going to be what was called a practical veterinary surgeon, Professor Woodhead said:

We are told that men cannot handle a horse now as they used to do, that they have not the same knowledge of his points, and that their practical treatment of his diseases is not what it was. Now, gentlemen, I do not believe this. That they do not devote so much of their time to the breaking in and management of horses, to the blistering, cupping, and setoning of horses, I may agree, but beyond this I cannot go. The man who is going into the country is the very man who should have his foundations sure and his training thorough, for in after life he is thrown entirely on his own resources, and unless he makes the most of his college training, there is only too great danger that he will settle down to an early professional life of blunders and losses, and, when experience comes, to one of dull routine and *laissez faire*. Not only are practical veterinary surgeons required, but men expert in all that relates to the prevention and treatment of disease. Such men must be trained for the public veterinary service; they have places to fill which are now imperfectly filled by other men, and they have a work to do which can be done by them, and them alone. All will find that a combination of the scientific and practical, such as they obtain here during their course, will be essential to their professional success.

Professor Woodhead then contrasted the present practical training with the old system of pupilage to the detriment of the latter, and agreed that a man's future career must depend on his very early training, and that a man born and bred amongst horses must make, other things being equal, a better practitioner than one who has only come in contact with animals during his four years' course at college. He continued:

If I were asked to commit a horse of mine to the care of the well-trained college student on the one hand, or to the so-called practical man who has wasted his time at college, or who has neglected his principles in order to devote more time to his practice, on the other, I should have no hesitation as to which I should select. I have a theory in regard to the men of my own profession that I think might apply with equal force to yours—*i.e.*, that the best men in the profession will learn anywhere, that the worst are practically hopeless and will learn nowhere, but that the success of the average man depends largely upon the nature and extent of his early and professional training.

Professor Woodhead then referred to two different schools characterised by different methods, and said that from his own observation the so-called practical man appeared for a year or two to get ahead of his more scientific compeer, but at the end of five years there was no comparison between the two men; he thought that if a man's principles and methods were sound and scientific his practice was soon perfected, whilst if these were faulty or absent

there was far too great a danger that practice might become mere routine. As Sir Michael Foster had said at the meeting of the British Association the other day, scientific men might be commonplace and their methods merely founded on commonsense, but science was a glorious temple built by commonplace men and of commonplace materials. He then referred to the danger of looking upon their own work as finality, and in connection with this quoted the well-known words of Darwin, who said:—"What a science natural history will be when we are in our graves, when all the laws of change are thought one of the most important facts of natural history." Then, referring to Darwin's work, he said that the fact that some of his analogies, of which he cited an instance, could not now be accepted did not render the work any the less valuable. Tradition, which would not stand the light of present-day observation, must go by the board, but let them not be blinded by a too close and continuous application of their mind's eye to what was simply before them. He thought that temporary introspection was valuable. He then quoted three instances to show that, although they were called a practical people, they did not exhibit that practical spirit in anything like the degree that they ought to expect. For years swine fever had been a scourge amongst them. They had had an elaborate system of inspection and central examination, and of compensation, but how far had they been successful in coping with the disease? He believed that they were going the wrong way to work to get rid of the disease, though he was open to correction on any points of detail. He could not help thinking that the permanent system of compensation had something to do with the continuance of the disease. The fact that the farmers knew that the loss would not be borne entirely by themselves acted, he thought, as a hindrance to any active efforts to prevent the disease. He said that some temporary system of compensation might, no doubt, be just, but it should be for a period only sufficiently long to enable effective measures to be taken against the spread of the disease. With regard to inspection, however worthy the present men might be who carried on the work, they were not fitted for the work which they had to do. He was of opinion that for the actual inspection of buildings and of animals—dead or alive—only a thoroughly qualified veterinary surgeon should be employed. During the time the present inspector was gaining his experience, the lesions and irregular forms of the disease were centres from which infection might be spread broadcast. The present inspector—not a scientific man—could not keep himself *au courant* with most of the recent discoveries as to the pathogenesis of the disease; he must always be behind the veterinary surgeon and never so completely equipped. He asked what inducement had the ordinary inspector to get rid of swine fever? He had been taken from his previous occupation to stamp out a disease by the disappearance of which his present occupation would be gone. This would not weigh with the bulk of men, but in every sphere of life there were a few men with whom that would have a certain amount of weight, even though perhaps unconsciously. He suggested the following experiments: (1) to offer to the inspector of a district an honorarium as soon as swine fever was cleared out, and on the disappearance of the disease to appoint the inspector to some administrative Civil Service post in which his salary, present and prospective, should be at least equal to that which he had received as inspector; and (2) that no one except a veterinary surgeon should afterwards be appointed to take charge of the purely veterinary and hygienic inspections in connection with the outbreaks of swine fever. It would not be necessary that he should be specially appointed, but he should be one of a departmental staff in the course of whose work the outbreak of swine fever would be a mere incident. Now that they had anthrax, tuberculosis, swine fever, and similar infective diseases to deal with, the importance of having a large veterinary

staff was becoming daily more evident. It might be objected that the standing cost would be heavy, but he was satisfied it would be a mere fraction, first of all, of what was being paid out as compensation, but, more important still, of the enormous loss incurred through the ravages of diseases which were to a very great extent preventable. He then referred to the so far successful effort which had been made to get rid of rabies from their midst. The advocate of muzzling would have been laughed at and hooted a few years ago as cruel, and no Government would have dared to carry out the behests of such an individual. He held that Pasteur's researches on hydrophobia had been the means of rendering such a course as that recently adopted by the Board of Agriculture at all possible. When hydrophobia should break out again every dog in the kingdom would be muzzled at once, and there would not be a rabid animal in the kingdom in six months, instead of the interval before the disappearance of the disease being two or three years, as had been the case; universal muzzling would do away with the necessity for Pasteur treatment in civilised countries and in those where wolves did not exist. He concluded:—

I want you to think over these things, gentlemen. When you go out into the world you will have your part to play in advising the course of action to be taken by those who rely upon you for your assistance, and the more solid the foundation of your advice, the more it is based upon sound principles and scientific accuracy, the more readily will it be accepted by those for whose benefit it is offered. How markedly this applies to one of the qestions of the hour—tuberculosis. We are gradually coming to see that the spread of tuberculosis is not necessarily according to any one method, but that there are many forms of distribution. We have now got over what may be termed the "time of panic," and we have come to see that it is only by the co-operation of medical men and veterinary surgeons, public administrators, and of those who are interested in the raising of cattle and the supplying of milk, that we can gradually eliminate tuberculosis. One branch of this work falls to your lot. You have along with your medical brethren to educate people up to the knowledge of the fact that tuberculosis is a specific infective disease, and you have not only to point out that without the tubercle bacillus there can be no tuberculosis but also to indicate that the tubercle bacillus may be present without giving rise to tuberculosis; you have to show that, common as the disease is, it is a preventable one, and that the first thing to be done is to find out the centres of infection. It is for this reason that you are so thoroughly instructed in the use of tuberculin; you are to show the farmers that it is to their interest to have nothing but healthy stock. I am speaking to you now as veterinary surgeons. If I were addressing an audience of medical men I should have to point out other, and perhaps even greater or more important, methods of the spread of the disease, and I should have to insist upon other methods of prophylaxis and treatment. Gentlemen, I wish you a pleasant and instructive year, and I believe that you can have that in one way only—keep a sound mind in a healthy body. Health is one of the greatest gifts God has given us; without it the best trained mind cannot do its best work. To you, one and all, I say, do not loaf. Work while you are at work, but when you have finished and feel that you have done your duty play your very hardest, and apply practically in your own case those physiological laws concerning muscular action, respiration, and nutrition by means of which mind and body may be kept in a condition that will enable you to give your very best to yourselves, your patients, and the community.

ROYAL (DICK'S) VETERINARY COLLEGE, EDINBURGH.

THE seventy-seventh winter session of the Royal (Dick's) Veterinary College, Edinburgh, was opened on Wednesday, the 4th October, and the introductory lecture was delivered by Dr. Charles Douglas, M.P. The chair was occupied by Sir James Russell, and among those on the platform was Sir Thomas Gibson Carmichael, M.P. In the course of some opening remarks, the chairman commented upon the changes and advances which had been made in medicine generally, and in veterinary medicine in particular, during the 77 years that the college had been in existence, and said the result of all these changes was that scientific teaching had been developed and the scientific man had found greater openings for the exercise of his practical skill.

Dr. DOUGLAS, addressing the students, said they had staked their fortunes upon the future of domestic animals at the very time when their very existence was threatened. The horse, they were told, was to be supplanted by the motor car, the cow was threatened by the use of margarine, the very pointer and setter were being driven out of the field by new methods of shooting game. It almost seemed as if nothing was to be left for them to attend to but the domestic cat. For his part, however, he saw grounds for encouragement. He saw excellent hopes for the future of the cow, even although butter and cheese might be driven out by margarine. They could not hope to keep out of the market a useful, cheap, and legitimate article of food by any protective legislation, and even if these things disappeared before margarine, milk, he thought, would remain undisplaced in their lifetime, and would be made of safer use by means of veterinary science. And even margarine, they must remember, depended to a large extent upon cows, for margarine had been described as the fat of the oxen, and they could not have oxen without cows. The case of the horse was more serious. At the present rate of invention, it was pretty evident that there was no longer a future for the cheap and inferior horse. For his part, he was not sure that that need be matter of very great regret, for the inferior horse had not had a very large share of the world's happiness. But even with respect to the horse, he thought they might be sure that their occupation had not by any means gone or was likely to go. The motor car would not end it any more than the railway had. The people of this country had an old and tried affection for the animal world, and whether they rode, drove, shot, trained, or hunted these animals, they did it with a respect—almost a reverence—which must be very gratifying to the animals concerned. This country held a prominent place in the industry of producing a high class of domestic animals. For a long time fine races of domestic animals had existed in this country, and he hoped we should continue to hold our position in that respect. That must be in itself an increasing source of occupation and of profit to the veterinary profession. In his view they were right in believing that the profession had before it a prosperous and honourable future. It was a profession which was bound to become more and more scientific, and which was bound to share in the general progress of medicine, and to become every year less curative and more preventive in its work.

Sir THOMAS GIBSON CARMICHAEL also spoke briefly, and on the motion of Councillor GULLAND a vote of thanks was given to Dr. Douglas.

THE VETERINARY COLLEGE, GLASGOW.

THE work of the session commenced on Wednesday, the 4th October, but the opening address was not delivered until Friday, the 20th October.

The chair was occupied by Bailie Chisholme, of the Corporation of Glasgow, and a most interesting address was delivered by Professor Young, of the university. Among those present were the following members of the profession: Messrs. Weir, Forbes, Blue, Trotter, Taylor, Allen, Constable, Kerr, Macfarlane, W. Owen Williams, and Drs. Lindsay, Chalmers, Beith-Henderson, Scott, etc.

Professor YOUNG said:—

Principal McCall, you have honoured me with permission to welcome those who come here for the first time, and those who return to resume studies already begun upon. I gladly discharge this duty, but harbour all the same something of envy that there is no longer before me the vista of time, success, and happiness now opening for each one of you. But if to age is conceded permission to murmur gently, to regret in subdued tones the lost opportunities of past years, it may atone for selfish discourtesy by seeking to guard you against similar regrets. Experience may point out how the error of taking the wrong road might have been avoided. I am neither so foolish nor so unkind as to seek to put old heads on young shoulders: each one must sow and, alas! reap his own crop.

My present purpose is to illustrate how nearly right we may be, yet wholly miss the true meaning of phenomena: how needful it is to revise all the links in a chain of reasoning, to make sure that each is duly rivetted to its neighbours, that no little defect is overpassed.

I was a pupil of Laycock, in Edinburgh, more than 40 years ago, and still look back on his lectures as those from which I learned more of natural history, of the principles of science, than I did from any other teacher in the medical curriculum. In the natural history class-room I learned much, and valuable knowledge it was, regarding the structure of animals; from Laycock I learned how such facts should be dealt with as part of the scheme of nature. I learned that the foundation of medicine was the recognition of morbid phenomena as disturbed perverted sequences in normal process, still normal even when most disturbed: the practice of medicine should be the effort to avert and, if that might not be, to combat the disturbance.

The doctrine was not new: the manner in which he enforced it entirely so. The lectures were a study in medical logic, enlightened and enlivened by rare scholarship. To him there was no distinction between human and veterinary medicine; they were not even species, only varieties of a single form. Accident alone prevented me from undertaking management of a large scheme whose wisdom was premature, but I hope that you may see the realisation of a union between the two departments, which I regret, deeply regret, I did not assist, with the certain prospect of success, under the guidance and with the help of Laycock and John Gamgee.

At that time physiology and therapeutics were the only subjects in which experiments were attempted, to which experiment was deemed suitable: now pathology seeks to enlarge its domain and assure its gains by the experimental method. Then, human anatomy and veterinary medicine were not realised as in any way related; now, the relations of animal to human epidemics are the subject of careful research. And yet we are no farther

forward, educationally, than we were 40 years ago, not so far forward as some of the American universities have been for a time. Four years ago my friend Dr. James W. Allen urged the need for an institution in which comparative pathology might be studied and taught systematically and experimentally, but the appeal has been vain, though made by one whose position in sanitary medicine gives weight to his words, and though the *Lancet* gave it editorial support. I venture again to urge this need, satisfied that if it is kept steadily before the public something may come, even if only in response to the importunate person who succeeds "because of much asking." The Local Government Board has created a College of Agriculture, and in the meantime the relation of the technical college to the university, the relation by virtue of which the student of agriculture might get a university degree, has been dislocated, but I trust that the readjustment may be completed by the inclusion of the Agricultural College in the co-operation. Is it too much to hope that this may be the means, sooner or later, of still further extensions? It is yet a problematical reform, but when it comes it would be unfortunate, to say the least, if damage ensued to the machinery erected 30 years ago with great skill and maintained with such self-sacrifice by Principal McCall.

When I last spoke in this hall I touched on the subject of bacteria, with the purpose of drawing attention to the somewhat crude generalisations based on the then imperfect data, and especially to the misleading pathology which seemed about to grow on an uncertain foundation. The practice based on the knowledge then acquired was good, though a trifle over-zealous, if only the reasons had been withheld. There is still something to be desired on the theoretical side; but it is beyond question that much valuable information has been gained—and that of a practical sort—in fields undreamt of twelve years ago, but the time is not yet when sweeping theoretical conclusions may be authoritatively announced.

Thirty years ago cattle in America suffered from southern or Texas fever, and the demonstration seemed complete that we had in it an example of pure physiological disorder assuming gigantic proportions. Cattle driven for long distances, mentally disturbed, bodily fatigued, imperfectly fed, left in the track of their wanderings a poison, threatening, too often, fatality to those which came after, especially if they were of another breed. As those which left the poison were themselves free of ailment other than yielded to rest and regular nourishment, it seemed an unquestionable instance of fomites—bearers of disease to which they themselves were immune. It was deemed also indisputable that the poison adhered to the soil over which the travellers had passed, that the excreta were the only available medium of adhesion, and were a sufficient vehicle of infection; the conclusion was, therefore, inevitable that disorder of the animal secretions gave the key to the disease. This proceeded on the hypothesis that disordered secretion could produce disease, and that the product would resemble Texas fever. Was this hypothesis supported by evidence? Carpenter had adduced one example where passion-disturbed milk had proved fatal to the sucking infant, and I think a fair parallel may be found in the poisoned wounds inflicted by excited drunkards on those who seek to control their violence, an analogy being offered by the normally altered secretion of crotalus and other serpent poison. It is said that the desiccated saliva of a healthy man may, in alcoholic solution, prove a potent poison to the mouse. But these are, after all, analogies and need confirmation by observation and experiment, such as would be most welcome to the zoologist. The theory of Texas fever was, so far, an hypothesis based on an hypothesis. But, assuming it to have been well established, there was an important residuum of facts which it did not account for. It was not noticed that the exposure of the poison to the air for some time might (probably would) result in its oxidation and consequent impotence.

Again, there were two periods of outbreak separated by a distinct interval, and there was an established relation between temperature and the virulence of the outbreak. Further, mere co-habitation did not suffice to spread the disease, as happens in, say, typhus fever. The perverted secretion hypothesis led to a further induction, that Texas fever belonged to the same category as yellow fever, a local disease adhering to the ports where the perverted secretions of those who had suffered the horrors of the middle passage were swept overboard. It was sought to establish these diseases as reminiscences of the perversions induced in the first sufferers of the series, and specially noxious to members of another race.

No scientific induction of recent years has impressed me with so deep an admiration for the scientific capacities of its author, one of the most accomplished pathologists of the day, and even if the hypothesis disappears before a more correct interpretation of the disease, we are gainers by the statement of it. The great Bohemian geologist, Barrande, once published a view of the succession of life in the rocks of his country, which, though unlike what was then believed, so exactly coincided with what might have happened that the view secured wide acceptance, and the copious criticisms launched against it touched everything but the one point where it was assailable. It was shown by Mr. Marr, a Cambridge student at the time, that the view rested on an erroneous reading of the strata, of which he gave the true interpretation. Barrande's theory disappeared: not so our admiration for him who framed it. It was a work of genius—the right application of principles to imaginary conditions. To have constructed the theory required consummate familiarity with the laws of zoology and a scientific imagination of the highest order. It failed, but there are many solid possessions of science equally due to a vivid imagination exercised on carefully ascertained facts. Many an important conclusion has been arrived at on grounds the mere statement of which would have sufficed to secure the rejection of the conclusion; yet subsequent research has only confirmed what was neither chance nor rashness. The conclusion, which was reached apparently by instinct, represents the working of a well balanced, well instructed logical mind, which "sees the future in the instant." In such contributions to knowledge experience is an essential, but not the essential. I remember Professor Syme asking a patient, seen for the first time, after a very brief glance at an ulcerated elbow, when the man had had a specific disorder. He read correctly what had happened 20 years before, what had all but escaped the memory of the patient. He said: "You will be curious to know why I put that question; I can't tell you, but when you have been as long in practice as I have been you will put such a question without hesitation." It was a remarkable instance of a rapid, almost instantaneous, passage of a complicated series of operations through the mind—the time of transit curtailed by the shorthand which summed up blocks of observation and reasoning. But the process was there, long or short, and it was a lesson worth bearing in mind as to the value of that physiognomical diagnosis which Laycock taught and the caricature of which has become a byword in literature of a sort.

So-called intuitions may help the progress of science, but I fancy that error is a greater aid to advance. The happy inspiration leaves no trace of how it was arrived at: the error has a double value, of its committal and correction. Isaac the Jew said, nine centuries ago, "Scorn not the errors of thy brother; every one has his good and evil days." Now, one would rather say, "Scorn not thine own errors; every one is to thee a lesson." The wide generalisation I have discussed illustrates what (was it Coleridge ?) a philosopher said—that the distinction between sanity and insanity was—the sane man reaches right conclusions from wrong data, the insane wrong conclusions from right data; if this were so, and, fortunately, the aphorism may be read the other way,

we should be losers; right the conclusions might be in their logical form, but that which gives seeming completeness to the induction is the error of deeming an inquiry complete and exhaustive when it is not.

Now the Texas fever inquiry showed no error of observation, no logical inadequacy, so far as the knowledge of the day went. The geographical association was the prominent fact, and if anyone had dwelt on the absence of infection, as opposed to contagion, had seen that there was no possible contagion as the term was then understood, if he had noted the double period of attack, and realised that anæmia was the leading feature and the cause of the fever, he still would have been without a guide to the significance of these facts. But a new line of research came to be opened up. Guided by that, the accuracy of the previous observations was confirmed; soil contamination and the rest remained in unassailable prominence. But the malady had yet to be found. Between 1883 and 1889 it was ascertained that a protozoan lodging in the red corpuscles of the blood destroyed them. It matters not what the protozoan was, scarcely even that it was a protozoan. Suffice it that it was a living organic form. This parasite was detected in the bodies of ticks which, adhering to the cattle, dropped off when bloodfull, and on reaching the ground discharged the ova for which they had gorged themselves. A tick has a good capacity for blood; it was therefore natural to say that the mischief was done by the quantity of blood abstracted, or by the irritation of the wound. But when few ticks are sufficient to establish disease, when its development is not accompanied by the presence of many ticks, when the ticks disappear from the dying, these are mere side issues. But ticks are in the main vegetable feeders, which transmit (at least the female transmits) the parasite to her progeny directly. Up to this point we have got a harmony between Texas fever, or, better, anæmia and ticks, aud this explains the local geographical relation and the non-infection, as well as the possibility of transmitting the disease by inoculation of blood.

Loupin ill, or trembling, as the term might be better rendered, has been studied of late years, with the result that the term has been found to include in popular use several kinds of unrelated ailments. But the form of which high temperature, increasing weakness, and muscular spasm are leading features, is found to be a local disease in this sense, that, though general over the country, it arises in each district within particular areas. Like the Texas anæmia, it may have, as in Skye, two periods of outbreak; or but one, as in the South, though these general statements need confirmation. The pathological appearances vary with the concomitant diseases, and often have obviously no connection of the causal kind with the fatal symptoms. One, however, is, if present, entitled to be called diagnostic—viz., yellow exudation somewhere within the spinal sheath. From these patches cultivations have been made and a bacterium reared. The ticks were next tried, and, whole ticks being used, cultivation yielded similar results, though more slowly when the ticks were taken from grass or from healthy sheep than when ticks from diseased animals were used. Dietetically the grass seems innocuous, but it must be pointed out that the negative results were got from few experiments, slightly carried out to obtain by cultivation from grass a toxin which might produce a disease presenting characters like those of the loupin ill. In the tick there is a change in the virulence of the poison—in what direction? There is thus an unsolved problem regarding these vegetable feeders. This is the more important that, however certain is the relation between the ticks and the loupin ill, the mode of complicity of the ticks has not been proved against them: at present it is merely circumstantial. One farmer has satisfied himself that by burning, cutting down, and feeding off the grass in his parks so that there shall be no old grass left over from year to year, he has abated in a few years both ticks and loupin ill: as an agricultural experiment this is valuable,

especially the burning of the cut grass instead of burning it where it stands. But, as a zoologist willing to believe any evil of animals so unhappy in their appearance, I must, in justice, ask proof of the performance imputed to them. Mr. Gibson Carmichael felt this, for he threw out a suggestion that perhaps the poison is transmitted from the grasses to the sheep through the ticks as the cultivators of the toxin. There are thus two reasons for cross-examining the grasses which harbour the ticks.

The tsetse spreads evil from beast to beast, its piercing proboscis being in direct contact with the toxic fluids which it inoculates. The gnat cannot shake off the imputation of spreading malarial poison. From experience I know that the toxic power of the clegg varies, either causing slight disturbance or constitutional disturbance of a graver sort, ending in limited suppurations. Anthrax was spread in Germany by flies, whose suctorial proboscis had been engaged with the discharges from eyes and mouth.

But germs in a tick do not get out on a tick by any process, for these are not of the sort which festoon dead flies or Australian caterpillars. It is very loose to say that the tick imparts the poison in the act of piercing. We must know whence the poison comes, and how it comes, if we desire to have a scientific basis for our precautions.

During recent years my acquaintance with the ailments of cattle has not been direct; I have therefore to estimate the progress of inquiries by the impression of completeness they convey in their published form. It seems that there can be no doubt as to the general parallelism of the two diseases, so far as their common source is concerned: the one an anæmia due to a protozoan, the other a nervous disturbance due to a bacterial parasite, both introduced into the body somehow from an ixodic epiparasite. The evidence is purely circumstantial, but rests on so wide an induction that practice must be guided by theory meanwhile. The veterinarian, the flockmaster, agree in their testimony. But while safety is provided for by accepting the theory as true, science requires a better quality of evidence. We have again a seemingly complete and conclusive body of testimony, but, just as thirty years ago the tick was not suspected, so now it is necessary to make sure that the tick is rightly suspected, and that he alone is to blame.

I am not greatly concerned how the problem is finally adjusted. The question has interested me, and you also, I hope, as one illustrating modes of investigation. But especially does it illustrate the urgent need for such an institution as I have spoken of, where the flockmaster, the veterinarian, and the chemist might be jointly concerned in a research having for its object the diminution, the prevention of disease, and the improvement of pasture land. The only opposition is likely to come, as it has done in the past, from those who call themselves practical, who, so boasting, are eminently and obviously unpractical, who rely on experience—their experience—as rendering experiment unnecessary.

An amusing case has come to my knowledge. A concrete tank leaked: of course the material was bad, or badly mixed, or badly laid on, or something. But the study of nitrifying bacteria supplied a hint. The man mainly interested knew the researches into agriculture manures. The hint was followed up and the mischief found to be due to the action of bacteria of similar propensities, and which had decomposed the concrete so as to allow it to leak; the impulse to hang somebody is meanwhile baulked. It now remains to be ascertained what might accelerate or retard the evil: whether a different way of mixing the concrete or laying it on, or, as I suspect, some mode of filtering the water before its admission to the tank, might not at least delay mischief.

Even a stronger case for the union of scientific resources is offered by the storage of food, which indirectly and importantly concerns the veterinarian

and in which the combination of various workers would economise time and money by translating results into more speedy practice. No doubt much is done by isolated observers, and this country is disposed to encourage isolated effort—it is easier than to organise; but, apart from the greater cost of this kind of work, how often do we find studies entered on to which more practical usefulness might be given by organised effort to meet the requirements of those whose living, and with their living the wealth of the country, depends on the adoption of the best means, the avoidance of uncertain methods.

Such institutions, with clinical hospitals attached, would realise the dream which, six centuries before our era, prompted the establishment in India of hospitals for men and beasts, hospitals in which regular clinical instruction was carried on. In the fifth century before our era the army of Kasmir was provided with surgeons for the troops as well as for the elephants and horses, while in Egypt and Persia human and veterinary medicine were practised by the same persons.

Our century has witnessed a wonderful extension of the range and deepening of the research on which the medical art must ever rely for trustworthy progress. But we in some ways have not improved on the methods of the antiquity we take it on us to despise.

I can teach you nothing which you do not learn here from those whose constant association with practice gives value to their words. I only ask leave to spend a few minutes in considering a particular case with fuller reference to the methods of research than can be given by your systematic teachers, whose time is fully occupied by the practice of which I wish you to gather the principles, as they illustrate themselves to an outsider.

THE NEW VETERINARY COLLEGE.

THE twenty-seventh winter session was opened on Wednesday, the 4th October. Among those present were the following veterinary surgeons:—Messrs. Borthwick, Aitken, Dalkeith; Aitken, Edinburgh; Rutherford, Edinburgh; Hickes, Market Weighton; Dotchin, Newcastle; Huttin, Kelso; Boyd, Melrose; Barclay, Fife; Donaldson, Alloa: Moir, Edinburgh; Lawson, Falkirk; Reid, Auchtermuchty; Pottie, Paisley; Cameron, Berwick; J. Connochie, Ayton; Bannatyne, Haddington; Sterie, E. Linton; J. Young, E. Calder; J. Brown, W. Calder; Bailies Pollard, Hay, Sloan, and Treasurer Cranston of the Edinburgh Corporation, and a large number of ladies, gentlemen, and students. Captain Stewart, of Westwood, occupied the chair, and called upon Principal Williams to deliver the introductory address:—

Principal WILLIAMS said he appeared before them for the thirty-third session as a veterinary teacher, and he had been in practice as a veterinary surgeon for 43 years, so that they would understand that the views he would express had been arrived at after mature consideration and wide experience. During his time he had witnessed many changes in the veterinary profession, and one of the greatest changes of all was in regard to the qualifying course. In Professor Dick's days a two years' course served to qualify an attentiv student for the V.S. degree, and at that time there was practically no

preliminary educational test at all. But since then the qualifying course had been lengthened, first to a three years' course, and latterly to a four years' course, while the preliminary educational test is as stringent as that required to qualify for the M.D. degree. This lengthening of the time and cost of the qualifying course, together with the rigid educational test, had told, in a most unmistakable manner, on the number of men entering their ranks. The veterinary colleges had suffered very uncomplainingly; but they hoped for better days, as the number of students now entering the colleges was altogether inadequate to supply the demand of the country, and qualified assistants were now almost unobtainable, while non-qualified men were increasing in numbers all over the country at an alarming rate. He was not, however, grumbling at the four years' course; but he did hold, and insist, that it would be much better for students and for the profession if the students were allowed to take both their educational examination and also their qualifying examination in two parts, instead of having to pass in all the subjects at the same time, as the grinding up for these examinations in seven or eight different subjects at one time led to a system of cramming rather than of sound, solid teaching. Having dealt at some length with this point, the Principal turned to the burning question of tuberculosis and its dangers to human life. Three Royal Commissions had lately taken exhaustive evidence on this question, and had issued their reports. But, instead of any real progress having been made by that, we seemed rather to be going backward, for at the recent Veterinary Congress one prominent gentleman, who ought to have known better, got up and tried to minimise the danger to human life, and the loss to stock-owners, that were undoubtedly caused by this disease. When that statement was made he (the speaker) felt impelled to speak out in a way which had been criticised as too strong, and perhaps it was strong; but, on looking back upon it, he was disposed to think that the terms he then used towards that other gentleman were very appropriate. Principal Williams proceeded to insist strongly that the disease was a contagious one, and was not hereditary, as was formerly supposed. The disease, both in the human subject and in the lower animals, was due to the presence and action of a specific bacillus —the *Bacillus tuberculosis* discovered by Koch—and that bacillus could be isolated and cultivated in culture media, and inoculations with these cultivated bacilli would inevitably give rise to the disease. They could not shut their eyes to these facts, and now every man of any standing in the veterinary and medical professions recognised the fact as to the disease being contagious and not hereditary. There were still known two surgeons in Scotland—one in Paisley and one in Hawick—who held by the old ideas as to the disease being hereditary and not contagious. The Principal went on to show that while the progeny of tubercular parents would naturally have a predisposition towards the disease, and would be less able to resist the attack of the bacillus than more robust creatures would be, yet, if they were kept under conditions which prevented the entrance of the bacillus into their systems, they would not contract the disease. After dealing at length with this point, the Principal went on to say that, within the last few weeks, some very important facts bearing upon the danger to human life through the use of tuberculous milk had been brought to light at the recent congress at Blackpool. Mr. M'Lachlan Young, lecturer on veterinary hygiene at the Aberdeen University, had read a paper detailing the results of his experience in testing a large number of cows, and examining their carcases after slaughter. Mr. M'Lachlan Young had found that, of the 65 cows examined, 39 were found on slaughter to be tubercular, and 6, or just a fraction under 10 per cent. of all the cows examined, had tuberculosis of the udder, so that their milk must have contained the bacilli of the disease.

Mr. Blackhurst had got practically the same results in the testing of a large herd of cows kept at an asylum in Lancashire, and there the sanitation of the buildings was perfect. They all knew that when the udder was affected with the disease the bacilli was found in the milk, and there was very real danger in using it; and the facts brought out by Mr. M'Lachlan Young and Mr. Blackhurst as to the prevalence of tuberculosis of the udder showed how imperative it was, in the interests of public health, that a resolute effort should be made by Government to extirpate this disease. He was satisfied that a well-considered scheme for dealing with the disease would not cost anything like the amount of money that some alarmists said it would. Referring next to the inspection of meat, the Principal insisted that carcases which were only locally affected were perfectly safe for human food if the affected part or parts were carefully removed. The inspection of meat should be in the hands of qualified veterinarians, who had passed a special examination and taken a special degree on the subject, as only in that way could uniformity of action be arrived at. Principal Williams next proceeded to discuss the investigations that were being carried out as to the source of the so-called malarial and yellow fevers in man. The fact had dawned upon some observers that the virus of these diseases might be communicated to human beings through the medium of the mosquito, and these observers had noticed that some islands which were free from mosquitoes were also free from these fevers, though they were in close proximity to other islands where mosquitoes were plentiful and fevers were rampant. He referred to this particularly, because up till a short time ago the transmissibility of disease from the lower to higher forms of animal life was never considered; and when, in 1879, he had expressed his belief that the sheep disease known as louping ill was communicated by the tick, he was looked upon as a dreamer. But time had proved the correctness of his theory, and it was now admitted on all hands that ticks can communicate more than one disease, as, for instance, Texas fever. He was very proud to say that the latest report from the West Indies was most satisfactory to him, it being stated in said report that, through following his directions, the disease in Jamaica had greatly diminished. In fact, in proportion as his directions for reducing the number of ticks had been carried out, the prevalence of the fever had diminished. The learned Principal concluded with an earnest exhortation to the students, and at the conclusion of his address he received an ovation.

On the motion of Bailie SLOAN, a hearty vote of thanks was accorded to the Principal. Treasurer CRANSTON, in proposing a vote of thanks to the chairman, expressed his entire concurrence with what Principal Williams had said as to the stringency of the preliminary examinations for the universities and veterinary colleges, and the advisability of the students being allowed to pass the examination in two parts. There was another matter which he could not help referring to, and that was the great desirability of bringing about the amalgamation of the two veterinary colleges in Edinburgh. On account of the reduction in the number of students, caused by the lengthening of the qualifying course—and the reduction would be still greater if the proposed Irish college, for which the Government had set apart a sum of £15,000, were proceeded with—both the colleges were suffering greatly; and it would be much better, for teachers and students alike, if, instead of having two colleges in Edinburgh, where one was amply sufficient, they had only one great well-staffed, well-equipped, and prosperous college. He hoped the day was not far distant when, instead of two veterinary colleges, there would be only one great veterinary college in Edinburgh, and he would be proud to see Principal Williams at the head of it.

JENNER INSTITUTE OF PREVENTIVE MEDICINE.

On the opening of the winter session on Monday, October 9th, Dr. MACFADYEN delivered an address upon the Jenner Institute and its work. He said it was only of late years that bacteriological inquiry had received any encouragement or support in this country, while the work initiated by Pasteur and Koch had found immediate recognition on the Continent. In Germany the Hygienic Institute was an essential feature of every university town, and a centre of active research in bacteriology and preventive medicine. In France bacteriological inquiry had always received encouragement. The Pasteur Institute recently opened at Lille was supported by the Government, the municipality, and the manufacturers of the district. In this institute, as in Paris, besides the study of the origion and prevention of infectious diseases, consideration was given to the industrial processes in which organisms played a vital part. It was only an infinitesimally small number of these ubiquitous forms of life that were capable of invading the human body. The vast majority were engaged in carrying out beneficial processes in the economy of nature. The results of bacteriological inquiry were not only of importance to medical men, they had a direct practical bearing on the work of the brewer, chemist, and agriculturist, and the commercial interests of a country. Ten years ago it was necessary to go abroad for the purpose of following such studies, and every one who had done so would acknowledge the stimulus received and the permanent value of the instruction that was so willingly imparted. London, the richest city in the world, lacked the facilities afforded by Paris, Berlin, St. Petersburg, or a small German University town. As the result of a meeting at the Mansion House in 1889, the Lord Mayor transmitted to M. Pasteur the sum of 40,000f. "in grateful recognition of the services rendered by him in the successful treatment of more than 200 British subjects bitten by rabid animals." The responsible committee resolved that it was desirable to establish an institute similar in character and purpose to the Pasteur Institute in Paris and the Hygienic Institute in Berlin. This was the genesis of the British Institute of Preventive Medicine, founded in 1891 in order to study the means of preventing and curing infective diseases; to prepare any protective or curative materials found to be of value; to provide instruction in preventive medicine; and to carry out investigations in all branches of bacteriology. No provision existed in this country for the promotion of these objects on a scale at all commensurate with their importance. A public appeal for funds and the response made showed that the idea of a national institution for the study of bacteriology met with wide approval. Work was begun in temporary premises, and ultimately transferred to the present and permanent home of the institute at Chelsea. An event of far-reaching importance was the public announcement of Lord Iveagh's intention to devote the sum of £250,000 to the promotion of the objects for which the institute was founded. The new articles of association, a condition of the gift, had just been confirmed by the court. The Jenner Memorial Committee having decided to transfer the funds in its possession to the institute, steps were taken to perpetuate the memory of Jenner and his work. This was insured through the change effected in the title of the institute to the Jenner Institute of Preventive Medicine. The institute had already published two volumes of transactions embodying work carried out in its laboratories. The anti-toxin department was engaged in preparing various therapeutic serums, notably the anti-diphtheritic serum, as well as in research in this important field of work. The primary object of the institute was research, but facilities were afforded for post-graduate instruction in preventive medicine and bacteriology. The students had come from all parts of the world, and a considerable amount of original work had been done by those trained

in the laboratories. Investigations were at present being made at the institute with reference to the possible cure or prevention of typhoid fever, tuberculosis, and other diseases. The diagnosis of infectious diseases was constantly being carried out for the main parishes of London, as well as the investigation of questions affecting the public health on behalf of sanitary authorities. The chemical and State medicine laboratories would find much to do in connection with water, sewage, food, poisons, etc. A notable addition had been made to the resources of the institute in the Hansen Laboratory for the study of the practical application of bacteriology to industrial and technical processes, and the most important results might be anticipated in the future from this branch of investigation. The institute had reached its present position without any official support, and its secure future was due to Lord Iveagh's enlightened action. The best endeavours of the management were being devoted to the attempt to find further means of ameliorating disease and suffering. At the same time they must never allow the community to forget that the pre-ordained conditions of health were light, air, and cleanliness. Unfortunately the overcrowding in the poor quarters of our large cities was reproducing mediæval and Oriental conditions of life. Medical research was looked upon with suspicion by many people in this country, and they were aware of the opposition that had been raised to the experimental methods that were a necessity in their work. The calls that were made on them for help against the silent ravages of disease were, however, a constant appeal to continue their endeavours in the hope that they might be of service "*pour la science, pour la patrie, et pour l'humanité.*"

Cases.

COMBINED PARALYSIS OF THE TAIL AND OF THE SPHINCTERS IN A MARE.

BY M.M. RAYMOND AND CADEAC.

THE mare kept her tail always hanging down, and no longer drove off the flies with it; she did not stretch her legs when urinating; when she trotted the urine escaped in intermittent squirts; defecation was no longer performed normally, and the balls of dung were only voided at the trot, one, two, or at most three at a time. Round the orifices of the sphincters there was marked œdema, which became gradually more voluminous. On the middle of the surface of the croup at the top of the sacral apophyses there could be observed a circular tumefaction of flattened conic form, slightly œdematous, eight to ten centimetres in diameter, presenting throughout all its extent exaggerated sensibility. The region of the croup to right and left of this tumefaction was likewise the seat of violent hyperæsthesia; pressure of the finger, actual or even simulated when the animal could notice the gesture, produced contractions of the subjacent muscles, the intensity of which, being proportional to the force of the pressure,

became so great that without much effort one could produce with the finger alone an abrupt sinking of the croup. The slightest excitement of the region, mere contact with the wind, a strong puff of breath from a man, sufficed to bring about these contractions. Rectal examination revealed nothing abnormal in the pelvis.

Diagnosis: Paralysis of the tail and of the sphincters, of medullary origin, localised in the sacral regions.

In spite of all treatment, the paralytic symptoms pursued their slow but continuous course, and the animal died with symptoms of colic. At the *post-mortem* the cord presented, at a point opposite to the sacral pairs, and a few centimetres before its termination, a swollen part which seemed to constitute a tumour 10 centimetres long, spread out anteriorly, which must have entirely filled the canal. The end of the ependymary canal was raised and pushed back towards the upper part, and this explains the predominance of the motor troubles over the sensory. At this point there was no trace to be found of adipose tissue; the cord was dense, firm, hard, fibrous, resisting the knife and creaking under a cutting instrument. There was reason to suppose that a fibroma, developed in the medullary canal, had encircled the ramifications of the cauda equina, and thus destroyed its nervous functions, but examination with the naked eye of a transverse section showed that the fibrous tissue was uniformly spread out; it was arranged in concentric circles round nervous tubes. In front of the tumour we observed, over an extent of two to three centimetres, a distinct softening of the cord; the nervous substance was soft and diffluent, but became almost normal in the anterior parts.

It is now established that this sclerosis of the cauda equina constitutes a clinical type well defined by the triple symptoms: inertia of the tail, involuntary expulsion of excreta, and dripping of urine.—*Journal de Méd. Vet. de Lyon.*

AN ELECTRIC DANGER FOR HORSES.

HERR RUSTERHOLZ, writing to the *Schweizer Archiv*, relates a somewhat startling story, which may put veterinary surgeons on their guard in these days when electricity is used everywhere. He says that two carriage-horses, belonging to a gentleman, got into the habit of suddenly refusing to take their oats. They both appeared to be in perfect health, ate their hay with an appetite, drank in the usual way, and took

their oats eagerly; but, at a given moment, after they had consumed a part of their ration, they tried to take up the oats at the bottom of their *iron manger* and suddenly recoiled, making curious movements with their heads. The animals did their work well, and seemed to be in good spirits, but the same strange conduct was repeated at each meal. When R. was called in, he began by examining all the food, especially the oats; everything was found to be of excellent quality. Wishing to see if the oats still lying in the manger had not undergone some deterioration which might explain the symptoms, he thrust his hand into the oats, which were now somewhat moist by admixture with saliva and water. Each time he did this he felt a curious tingling, such as is produced by the electric current. The stable being lighted by electricity, R. caused the wires to be examined, and this brought about the discovery that, over the horses' heads, the wire had become denuded of its insulating cover, the current was transmitted by the coat of paint, which had become an excellent conductor by reason of a slight coating of damp deposited on its surface through the condensation of vapour—it being winter-time—and this current reached the iron manger. It did not cause the animals any trouble as long as the oats were dry; but as soon as they became damp by the saliva and condensed vapour from the horses' breath, it took effect, and the animals were subjected to it every time they took a mouthful of oats. The wire was put right, and the horses began to eat as before. Herr R. wonders if it is not possible to gain instruction from this incident as to the treatment of tic.

NOTES ON RABIES IN THE HORSE.

BY PROFESSOR GALTIER.

THE agitated or furious type is the most commonly observed in horses, and it develops rapidly. In five cases of rabies which came under my notice, the disease evolved in the following manner. It began by restlessness and unusual agitation; the patients had become very irritable and excitable and kept grinding their teeth; they showed signs of colic, kept changing their position and incessantly striking the ground with their feet. One of them kept biting himself furiously and had made a big wound on his breast; two tried to bite their driver, and all showed an exaggerated sensibility of the skin, the slightest contact with any object whatsoever bringing about an attack. All of them became aggressive

and showed themselves greatly excited at the sight of a dog; they kicked and struck out with their hind legs, and bit at inanimate objects which were within their reach or were presented to them; the sight of a dog brought about a paroxysm of fury, with a tendency to rush upon the animal and try to bite it. All showed difficulty in eating and swallowing (dysphagia), with loss of appetite; two were hydrophobic. Respiration became accelerated and painful. The temperature went up sometimes to 109·4; sweatings made their appearance, first local, then general; in all of them weakness, followed by paralysis, supervened on the third or fourth day, showing itself sometimes in a fore-leg, sometimes in a hind-leg, and generalising rapidly. Death supervened on the third, fourth, or fifth day. On autopsy the following lesions were observed: deep discolouration of the flesh, congestion of the base of the tongue and pharynx, violent congestion of the salivary, parotid, and sub-maxillary glands; hæmorrhagic blotches in the ganglia of the region of the throat; congestion and ecchymoses on the peritoneum, arborisations on the external surface of the intestine; almost complete emptiness of the stomach and intestines; congestion, ecchymoses and inflammation of the gastro-intestinal mucosities; congestion and hæmorrhage in the liver and kidneys; congestion of the spleen; arborisations on the mucosities of the bladder; congestion, ecchymosis, and arborisations on the respiratory mucosities, on the epiglottis, on the mucosities of the larynx and on the tracheo-bronchial mucosities; ecchymosis on the endocardium; intense hyperæmia of the meninges and of the nervous centres, hæmorrhagic suffusions on the surface of the encephalic mass; innumerable hæmorrhages in the thickness of the brain, of the bulb, and of the medullary swellings.

Emulsions prepared with the bulb of four horses which had died from rabies were inoculated into guinea-pigs (intra-muscular injections), into rabbits (intra-ocular) and dogs (intra-cranial); all became rabid. But the incubation exceeded by from two to eight days that following on similar inoculations made with canine virus, so that we may suppose that equine virus is somewhat weakened.

Rabies in the guinea-pig may last for one, two, or three days, and sometimes longer; I have seen some live seven and eight days after the development of the disease—even nine days. Predisposing causes, such as torture, former diseases, etc., and strong doses inoculated, may hasten considerably the evolution of rabies and shorten the time of

incubation. I have frequently noticed that rabid guinea-pigs and rabbits, paralysed and having ceased to eat for two, three, or four days before death, present on autopsy a stomach filled with undigested food. It therefore appears that the gastric receptacle becomes paralysed after a more or less copious meal and preserves undigested the latest food taken by the animal.—*Journal de Méd. Vét. de Lyon.*

A CASE OF STRANGULATED INGUINAL HERNIA IN A HORSE: OPERATION FOLLOWED BY CURE.

A STALLION, eight years old, showing colic symptoms from the night previous, was brought to the Berlin veterinary clinique. Temperature elevated, pulse 37, respiration 12 per minute; mucosities injected, abdomen inflated, peristaltic movements stopped. The animal stood quite still, but from time to time scraped the ground with his fore legs. The left sac was drawn back; the right descended lower, and presented the volume of a man's head; the outlines of the corresponding testicle were not visible, but only perceptible to the touch, which likewise acquainted the operator with the firm consistency of the tumour extending into the inguinal canal, and forming a pedicle of the thickness of a man's arm. Pressure produced a little pain, which disappeared as manipulations were continued. Rectal examination showed slight distension of the large intestine, and penetration into the internal inguinal ring of two smooth cords of the thickness of two fingers. The duplex nature of the herniated part forming an ansa, or loop, with a smooth surface on the one hand, and on the other hand the presence of abdominal pains, justified the diagnosis of exterocele.

A first attempt at reduction by external and internal treatment combined having failed, both on the standing and lying animal, it was decided to perform celotomy. A broad incision was made in the skin and the dartos as if for castration, whilst the vaginal tunic was cautiously opened over a small extent. There flowed out from the opening about a litre of dirty red serum. The opening of the wound was then increased with the aid of scissors, and the testicle, in spite of an adherence, could then be brought out. There then remained in the tumour, largely broken down, only an empty intestinal loop a finger-length long. The intestine was so pressed into the internal inguinal ring that the operator experienced great difficulty in introducing his

index finger into this opening. Renewed efforts at reduction were no more successful than the former, in spite of the use of chloroform and the help of an assistant acting as from the inside. The operator then proceeded to the opening of the collar of the hernia by incising with scissors its posterior angle, whilst the index finger, acting as a conductor, pushed forward the cord, and the strangulated intestinal loop; the reposition then took place of itself. In order to prevent a recurrence, castration was performed. The results of the operation were normal, and the animal left the hospital ten days after.—*Morats für prak. Thierheilk.*

Reviews.

THE ART OF HORSE-SHOEING. By WM. HUNTING, F.R.C.V.S. 3rd edition. London: H. & W. Brown. Pp. 167. 5s.

From the farrier's point of view, the world may be divided into three classes: those who hold that shoeing is an unnecessary evil; those who think it is a necessary evil; and those who maintain that it is necessary and no evil. The first class is an exceedingly small one. Therefore, being so much in the minority, its members are counted faddists. Mr. Hunting does not in any way agree either with these faddists or with those who speak of shoeing as "a necessary evil." "The phrase," he says "is a misuse of words, for there is no necessary evil about it. Of course it is no more free from accidents than other operations, but its evils are fairly described as accidents, whilst its benefits are apparent to all but the blind." We are inclined to think that few indeed will deny that horse-shoers perform invaluable services to the community, provided always their work is properly done. It was with the purpose of pointing out how this work should be done, what the errors are into which the farrier is liable to fall, and how he is to avoid them, that the work now under review was written. Not that this was the author's sole purpose, for, as he says in the preface to the first edition, "this little book is written for three classes of readers: for horse-owners who may interest themselves in the subject, for farriers who are open to conviction, and for veterinary students who have to be examined." We may say in brief that it is a work which might be consulted with profit by anyone who has any association whatever with horses. That the value of the book has been appreciated we may infer from the fact that

the first edition only appeared in 1895. In 1898 an American edition was published; and now we have the third edition in our hands. This edition has been considerably enlarged and many new illustrations have been added, resulting, we doubt not, in a corresponding increment of utility.

For the benefit of those who, for any reason, did not procure a copy of the former edition, let us say that the book is divided into thirteen chapters, dealing with such subjects as: The form and action of the foot; the preparation of the foot; foals and unshod feet; the form and manufacture of shoes; the selection of shoes; the fitting and application of shoes; "roughing" for frosty weather; injuries liable to arise from shoeing; the methods of shoeing most suitable for bad or defective feet; the use of leather and rubber pads and the use of occasional shoes, such as the bar, the patten, etc. The last chapter contains some very valuable hints regarding the best way of conducting shoeing competitions at shows.

The illustrations are numerous, clear, and, wherever possible, reduced to their simplest form, so that anyone, however dull of comprehension, may easily understand them.

Bearing in mind the public to which he appeals, Mr. Hunting has been well-advised to reduce technicalities to a minimum. Partly on this account, partly because of the simplicity of language in which they are couched, his descriptions, even of so complicated a subject as the anatomy of the foot, are characterised by a noteworthy clearness.

Able editor, conscientious observer, impartial politician, as Mr. Hunting is, we may further say that he has added to his attributes that of a common sense farrier. His "Art of Horse-Shoeing" should be on the library shelves of all veterinary practitioners, and in such a position that it can be easily got at for the purposes of reference.

MESSRS. ROBERT BOYLE AND SON, 64, Holborn Viaduct, have published a book on "Natural and Artificial Methods of Ventilation," which will well repay perusal. It contains the statements and opinions of most well-known scientists and sanitarians, and extracts from the official reports of commissions on ventilation appointed by many governments.

Honorary Secretaries of veterinary medical societies and associations are informed that if they will forward the MSS. of their proceedings before the 18th of the month, the Editor will have much pleasure in returning them proofs within a few days thereafter, so as to enable them to be correctly inserted in the VETERINARY JOURNAL.

ABORTION IN CATTLE.*

BY VIDORA.

(*Continued from page* 236.)

With regard to the bull.—Many people believe that the male animal when diseased, enfeebled with age or excess of work, or debilitated from any condition whatever at the time of copulation, fails to produce a healthy and vigorous embryo, and so predisposes to abortion or premature birth; all observers, scientists, and breeders are agreed that the health of the ovum is influenced considerably by the condition of the male at the time of service. Again, the bull, by serving a cow which has aborted, may transmit the contagion to the next animal he serves if the case in question be one of a contagious nature.

In all probability the majority of the internal causes of abortion produce their effects by causing some alteration in the blood supply of the fœtus. A diminution in the quality or quantity of nutriment sent to the embryo would lead to its imperfect growth and development, and if continued for any lengthened period would ultimately end in its death, when the act of abortion would arise as nature's effort to expel from the uterus a body which is now foreign and unnatural to it.

During gestation several functions of the mother are in a more or less exalted condition; to meet the ever increasing demands of the fœtus, there must be an increased activity of the circulatory system; the nervous system seems also to be easily excited. There is increased sensibility of the uterus itself; from this it will be readily understood that the animal is more than ordinarily affected by the operation of common every-day occurrences during the pregnant state.

Pathology.—The pathological conditions usually met with after cases of sporadic abortion, especially when pregnancy is well advanced, are not well marked. The carcase itself is very little changed, the chief alterations noticed are in connection with the genital organs, which are very similar to what they are after a normal parturition. The uterus itself looks congested, its walls are thickened and it is contracted on itself, its cavity contains a certain quantity of blood-coloured mucus, the cotyledons are enlarged and congested, and the fœtal envelopes may be attached to them, the os uteri may be closed or open, the vagina is congested, the lips of the vulva also congested and swollen. The appearance of the fœtus varies according as to how long it was retained *in*

*Read before the Edinburgh Veterinary Medical Society.

utero after death: as a rule it is expelled shortly after death, and is then practically little altered, its size and condition, of course, varying with its age; if the fœtus has been retained some time after the escape of the "waters" it is exposed to the influence of the atmosphere, putrefaction soon ensues, gases are evolved causing a most disagreeable odour, and perhaps an emphysematous condition of the fœtus, in some instances the hair and hoofs are readily removed, and in prolonged cases of fœtal retention the flesh comes off the bones. The uterus itself contains a dirty, reddish-coloured fœtid fluid, and shows signs of metritis, abscesses may form in its walls and form fistulæ, through which portions of the fœtus may be expelled.

Symptoms.—These vary very much according to the period that has elapsed since conception took place, frequently no premonitory signs are exhibited, simply the dead fœtus is found enveloped in the fœtal membranes in the grip behind the cows or may be in the field, the mother appearing in her usual state of health, as if nothing extraordinary had occurred.

This is often the case in abortion occurring during the earlier stages of pregnancy, *e.g.*, before the fourth month of gestation.

In other cases, again, the following precursory signs are manifested (there is very little difference between these premonitory symptoms and those observed before a normal parturition, except that they are developed in a much shorter time).

For about two days before the mishap occurs there is a swollen œdematous condition of the vulva, the mucous membrane is injected, an escape of a glutinous, dirty red catarrhal or muco-purulent discharge from the vagina, the ligaments (pelvic) are relaxed, the ischiæ are prominent, there is flushing of the udder, in primipara the teats form as normally. If the animal be in milk at the time, there is a decrease in the yield, and at the same time it takes on a colostrum-like condition; there may be slight restlessness on the part of the mother, and after two or three labour pains the fœtus is expelled without difficulty unless some complication be present. In these cases there is frequently retention of the fœtal membranes, and some difficulty is experienced in removing them, and each cotyledon must be unbuttoned separately. Complications may also arise from retention of these membranes. In other cases, again, there may be an unsteady or straggling gait, hurried breathing, haggard

expression, frequent straining, and, if the fœtus be alive and capable of much movement, there may be symptoms of abdominal pain, and finally expulsion. In some cases, where the fœtus is alive and then succumbs just prior to the act of expulsion, the mother may seem relieved, and the symptoms pass off for a day or two, when, however, after a slight amount of straining, the contents of the uterus are easily expelled.

Treatment.—The treatment of sporadic abortion is preventive and remedial.

As regards the preventive treatment, we must bear in mind the causes previously mentioned as producing abortion. The pregnant animal must be in good hygienic surroundings. No further intercourse must be allowed with the male; the food must be of good quality, very nutritious, sufficient in quantity, easily digested, and not likely to cause indigestion, tympanitis, purgation, or obstinate constipation. Grazing on pasture is favourable to herbivora, if the land is fairly level, as a certain amount of exercise, which is very beneficial to pregnant animals, is obtained, and there is an abundance of pure air; but should the weather be at all unfavourable they must be comfortably housed, and if there is not a sufficiency of grass, other food must be allowed in addition. In certain districts it may be necessary to add saline materials to the food, as a preventive against certain bone diseases of the offspring and mother.

The water must be pure and abundant, and at no time must the pregnant animals be allowed to drink it icy cold.

The animals must at all times be treated with the greatest kindness, and all causes of fear or excitement avoided as far as possible.

Surgical operations and medicines in general should be avoided, especially drastic purgatives. If the animal is known to have a predisposition to abort, special care is needed, every precaution possible being observed to prevent a recurrence of the mishap.

Remedial Treatment.—When abortion appears to be imminent, and the veterinarian is called in in time, and he is sure that the fœtus is still alive, that the membranes are intact, and that the labour pains have been few and not severe, the accident may be prevented by the administration of powerful narcotics such as tinct. opii, or chloral. hyd., and by keeping the animal as quiet as possible.

When rupture of the membranes or death of the fœtus has occurred, it is necessary to bring about its expulsion as soon as possible, and to remove the fœtal envelopes.

The after treatment is that required after a normal parturition.

Contagious Abortion.

For many years the belief that some specific organism or virus was responsible for many outbreaks of this disease has been held by practical observers, and the results of recent investigations tend to confirm this view. This form of abortion is usually found occurring as an enzootic or an epizootic, attacking a great many pregnant animals on a farm or in a district, and not in isolated cases.

A short history regarding contagious abortion will not be out of place here, I think.

As early as the 18th century the contagious character of abortion was firmly believed in, and tar was placed on the external genitals of cows and mares to protect them against its ravages.

In 1804, Fluorin says: "Peasants are firmly convinced of its contagiousness, and they take the abortion out of the byre, not by a door, but through the window."

The *Complete Farmer* advises burning the abortion and the isolation of aborted cows. Whilst not accepting the theory of contagion in its entirety, the earliest veterinarians advised burning the abortion, isolation of aborted cows, and disinfection of byres, etc.

About 1820, however, many Continental writers doubted the contagious character of the disease, and brought forward once again the theories that held sway many years previously, viz., the influence of wet seasons, insufficiency of food, etc., Skellett, about this time, advocating the theory of bad smells producing abortion, and Grognier the sympathy or imitation theory. The incompleteness of all these suppositions regarding the etiology of abortion soon again became apparent, and in 1851 Professor Barlow said: "In all cases of abortion, before and after expulsion of the fœtus, there is a discharge of mucus and glairy fluid from the vagina, which I believe contain the virus of the disease," and from this time the idea that the disease was of a contagious character has been steadily gaining ground, and very few can be found now-a-days to contradict this view.

Franck obtained abortion by placing a piece of the fœtal membrane from an aborted cow in the vagina of a healfhy pregnant cow.

Roloff attributed it to an infectious element gaining access to the uterus by the vagina, and causing swelling and catarrh of its lining mucous membrane.

St. Cyr said epizootic abortion was due to a truly specific agent, at the same time he formulated methods to be adopted to prevent its spreading.

In 1885 the researches of Nocard at Niévre resulted in the discovery of the invasion of the fœtus and its membranes by microbes not found in the tissues of the mother, and, he concluded, infection followed the soiling of the external genitals of pregnant animals.

In 1886, the Highland and Agricultural Society organised investigations regarding the etiology of abortion, the results of which fully supported the theory of contagion.

Galtier studied a special form of abortion due to the invasion of the mother by the bacteria of septicæmia hæmorrhagica.

Smith observed an enzootic abortion in mares; and in the vagina of aborted animals he found a bacillus analogous to that of hog cholera, and intravaginal injections of cultures of this in a pregnant mare produced a purulent catarrh which lasted many days.

Biot considered abortion to be an infectious inflammation of the serous coats of the uterus.

In 1897, Bang published the results of experiments made by himself concerning this disease; these also corroborated the researches of Nocard, viz., that penetration of the gravid uterus by specific pathogenic bacilli caused abortion: these micro-organisms he isolated and cultivated, and intravaginal inoculations of the cultures gave positive results.

In 1897, Lignières also made known the results of his researches. He saw a special form due to a primary infection of the mother, and secondary infection of the fœtus by multiple microbes non-specific in character, and which one always meets with in variable numbers in the uterus of breeding cows.

It will thus be seen that for a considerable time the disease has been supposed to be of a contagious nature, and most stockowners who have suffered from the ravages of this malady will tell you, upon inquiry, that they never had abortion till the introduction to their herds of an animal from a district where abortion was rife; and the experience of breeders and veterinarians in other countries agrees with our own.

Before proceeding to the experimental study of abortion, I shall just mention a few clinical observations which doubtless are well known to all of you.

If a pregnant animal be placed in a byre previously occupied

by one which had aborted, sooner or later she, too, will abort—unless she is very far advanced in pregnancy, in which case she will probably calve at the normal period, but yet retain the infective agent to produce abortion some time during the next period of gestation. Again, if a cow be brought from an infected herd and placed in a previously healthy herd, if pregnant, she will abort, and, in any case, all, or nearly the whole, of the remainder, if pregnant, would abort in succession.

A striking instance of the danger of introducing pregnant cows into a healthy herd is quoted by Professor Penberthy in his report of investigations instituted by the R.A.S.E. The proprietor of a farm, on which abortion was unknown, sold an animal reared by himself to go to a neighbouring farm, on which the disease was exceedingly troublesome. After twelve months this cow was repurchased by her former owner and taken home again. About one month after her return she aborted, and in a short lapse of time this was succeeded by many others, and since then abortion has gone on to a serious extent in the herd. No other new cow or bull had been introduced except this one.

Breeders of stock will not purchase an animal which has aborted if they can possibly avoid it, knowing full well that she would introduce abortion into their healthy stock.

The infection may also be spread by attendants' boots, by the litter and manure ; and it is also said that if a bull serve an aborted cow, and in a short time afterwards a healthy one, the latter will also abort sooner or later.

These and numerous other similar cases point conclusively, I think, to the contagious character of the malady. If this is so, the question naturally follows—What is the contagium, and how is the disease spread?

Before answering this question I shall bring before your notice a few recent experiments and investigations made by scientists in their endeavours to discover the specific organism producing abortion.

Nocard says: "The disease is one not affecting the cow generally; her health seems unimpaired; it is one affecting the genital organs of the mother; mainly, it is a disease of the fœtus and its membranes." He bases these conclusions, first, on *post mortems* of cows about to abort; second, of cows on the point of aborting; and third, of cows that had aborted the previous year, and had not since become pregnant. Samples of blood, milk, urine, etc., taken from a cow the same day after aborting a five months' old calf were found to be

normal, but fluid taken from the cotyledons and lining membrane of uterus was found to contain bacilli and micrococci; after 48 hours both cultivations produced the same organisms, whilst that from other portions of the cow did not produce any. Other *post-mortems* gave similar results. Then a cow that had aborted several months previously, and had since refused the bull, was killed; her viscera was also healthy, but fluid scraped from the lining membrane of uterus swarmed with living organisms, whilst it was found to have an acid reaction, that of healthy cows being alkaline. The fluid from non-aborting cows of healthy herds was found to be free from any such organisms. With regard to aborted calves, Nocard did not find the micro-organisms in the blood, bile, spleen, liver, kidneys, etc., but in the fluid of the stomach and intestines, and also in the medulla he got cultures of the same micrococcus as was found in the liquor amnii; it was necessary to examine calves born dead, as micro-organisms are always found in the alimentary canals of animals that have had a separate existence. He thus demonstrated the presence of organisms in the digestive tubes of aborted fœtuses, but could not do so in those of healthy animals. He concludes by saying: "The autopsy of diseased animals does not reveal any alteration in the thoracic or abdominal viscera, except the uterus.

"As regards this organ the peritoneal serous membrane is normal; incision reveals the presence between the mucous membrane and the chorion of a fibrinous muco-purulent matter, more or less abundant, often acid, in which the microscope shows epithelial cells, leucocytes, a large number of isolated micrococci, which are generated or associated in short chains of three, four, or five sections, and a few short, thick bacilli, which are isolated or associated in pairs. In the cotyledonous liquid the bacilli are predominant in the product obtained by scraping the uterine mucous membrane; both micro-organisms exist in almost equal numbers. The amniotic fluid also contains them. In the aborted fœtus, the intestinal mucous membrane is the seat of abundant epithelial desquamation; its tissue seems infiltrated with various microbes which exist in abundance in the contents of the stomach.

"These organisms in the digestive tube give an explanation of the diarrhœa by which fœtuses born alive are affected in the two or three days following expulsion. In the abortive young which bellow continually during the day preceding death the medulla contains micrococci, identical with those found in the amniotic fluid."

In a later communication Nocard says: "I wish to put on record an observation which shows that abortion may indeed be set up by several kinds of organisms. After a careful autopsy of aborted fœtuses in another outbreak, and on making cultures, I found I was dealing with a pure culture of the bacillus coli." He then proceeds to say the disease was the result of an infection of the fœtus by the bacillus coli, an infection from which the mother appeared quite exempt; the bacillus probably gained access to the fœtus per vaginum during decubitus of the dam, the lips of the vulva thus coming into direct contact with fœcal matter which contained the bacilli (as the fœtus was born dead, a secondary infection, *post-mortem*, could not be set up). From this we see that the bacillus coli may take on pathogenic characters and may produce grave disorders and even death.

Bang found a condition very similar to that just described and also bacilli. These were of various sizes, from $4 \times \cdot 2\mu$ and smaller; they stained with the aniline dyes but not by Gram; the best culture medium was serum gelatine, and injection of these cultures into the vagina produced abortion in the cow, sheep, and mare; the only characteristic *post-mortem* changes were (1) an odourless, dirty yellow, flocculent, slimy, and more or less thin exudate between the uterine walls and the fœtal membranes; (2) œdema of the sub-choroidal connective tissue, which is consequently abnormally thickened, slimy, gelatinous, and brittle.

In 1886, the Highland and Agricultural Society appointed a committee to make investigations regarding abortion; the experiments made by this committee were conducted on cattle and sheep, at a farm where abortion was known to be prevalent, and, in short, were as follows:—

I. A cow that had aborted a few days previously was housed for a month along with a pregnant cow. Result negative.

II. A pregnant cow from a healthy herd was introduced into a byre in which a number of cows had recently aborted; a plug of cotton wool was inserted into the vagina of a recently-aborted cow, and left there for 24 minutes, when it was withdrawn and inserted into the vagina of the experimental cow. This was repeated the following day. Within one month this cow began to show premonitory signs of abortion, but this did not occur until after 70 days, at which time the cow had nearly two months to go till full term. The placenta was retained, the calf being born alive, but only surviving a short time.

III. A cow about six months pregnant, purchased from a healthy herd, was placed in a byre along with some recently-aborted cows; a quantity of vaginal discharge from the latter was subcutaneously injected into the skin of the vulva of the experimental cow. The inoculation material was mixed with sterilised water, and injected with a sterilised syringe. The cow calved one month prematurely, and the calf, although it survived, was puny and unthriving; the placenta was retained.

IV. A cow purchased from a healthy herd was placed in a byre along with recently-aborted cows; neither inoculation nor the introduction of vaginal discharge was practised, and the result was negative.

V. Two cheviot ewes were inoculated in the same manner as the cow in No. III. experiment; 38 days after one lambed a dead lamb, and the day after the other lambed a living but weakly lamb. At the time of inoculation the ewes were about two months off the time of lambing.

VI. Cotton wool plugs, previously inserted into the vagina of a recently-aborted cow, were introduced in the genital passages of two black-faced ewes and left there some time, and subsequently the same procedure was repeated with a plug withdrawn from the vagina of an aborted ewe; 30 days after the first insertion one ewe aborted, the lamb being dead and about one month before its proper time; the other ewe carried her lamb to full term.

A bacteriological examination was then made of the uterine discharges after abortion, for if the occurrence of abortion were due to the invasion of an organism it is fair to presume that it would be found in some stage of its development in these discharges.

The usual method adopted in the study of infectious diseases was practised here. It consists essentially in obtaining a pure sample of the discharge, planting it with all due precautions in a fertile soil, prepared in such a manner as to exclude all other organisms except those under investigation. The culture medium used was nutrient gelatine contained in glass tubes plugged with cotton wool and rendered completely sterile by prolonged heating to a temperature fatal to germ life, and cultivations were made as follows.

Before the cotton wool plugs were soaked with mucus in the vagina, a small portion of the discharge was taken from as near the mouth of the womb as possible by means of a long blunted platinum needle previously sterilised by heating. The needle, with the adherent mucus, was plunged into a tube

of nutrient gelatine. Six of these tubes were thus prepared. A fragment of the soaked cotton wool was immersed in distilled water, and several cultures of the mixture were made in the nutrient gelatine tubes, and with the mixture also Experiments III. and V. were made. The tubes in which mucus alone was inoculated were divided into two sets: with three of them plate cultivations were made, and the other three were set aside for observation; the same was done with the tubes inoculated with the mixture of mucus and water.

After a careful examination of the tubes and plate cultivations, five separate organisms were identified organisms which were present in every one of the inoculations made into nutrient gelatine. In those tubes inoculated with the mixture of mucus and water, three or four organisms were seen which were never found in the pure cultivations. It was believed that these were present in the water, as the cotton wool had been previously sterilised by heating to 170° C. for some hours and preserved in a sterilised bottle. These organisms will be referred to again later on.

(*To be continued.*)

Proceedings of the Royal College of Veterinary Surgeons and Veterinary Medical Societies, etc.

ROYAL COLLEGE OF VETERINARY SURGEONS.

Quarterly Meeting of Council.

The quarterly meeting of the Council of the R.C.V.S. was held on Tuesday, the 3rd instant, at the College, Red Lion Square, Mr. J. Fraser, president, in the chair. The following members were present:—Professors Edgar, McFadyean, Penberthy, Pritchard, Shave, and W. O. Williams; Messrs. Abson, Allen, Barrett, Bower, Carter, Elphick, Hartley, Mason, Mulvey, Simpson, Trigger, Villar, Wartnaby, and Wragg; Mr. A. W. Hill, secretary, and Mr. G. Thatcher, solicitor.

The minutes of the preceding meeting were taken as read, and confirmed.

The Secretary stated that he had received letters of regret at inability to attend the meeting from several members, amongst them being one from Colonel Lambert, who had met with a severe accident.

Correspondence.

The Secretary read a letter from the Privy Council Office with regard to Prince Mowvji Dhakmarvala, whose application for enrolment was refused by the Council of the R.C.V.S., inasmuch as under the present regulations no foreign or colonial body was recognised for registration. The prince had

appealed to the Privy Council, which body had forwarded the documents to the Council of the R.C.V.S.

Mr. THATCHER (solicitor) said that the Bombay regulations did not come up to the standard required by the college.

On the motion of Mr. TRIGGER, seconded by Mr. MULVEY, a draft answer was directed to be prepared by the solicitor, giving the reasons for the council's refusal to register.

The SECRETARY read the following letter from the Lancashire Veterinary Association :—

Manchester,
September 8th, 1899.

Dear Sir,—The following resolution was passed at our quarterly meeting, held last night, and I was instructed to forward it to the Royal College of Veterinary Surgeons, to be put before the council at its next meeting :—"That this society view with regret the attempt of the Sanitary Institute to inaugurate a quasi veterinary examination, which must be impossible for any but a veterinary surgeon to pass, or else must be of such a character as to render it a complete farce, and calculated to mislead the public."

Yours faithfully,
H. LOCKE, *Hon. Sec.*

Professor W. O. WILLIAMS : I should like to say a few words in connection with this matter. The first intimation of any importance appeared in the *British Medical Journal* of August 12th, which stated that "The report of the Royal Commission on Tuberculosis recommended that no person should be permitted to act as meat inspector unless he passed a qualifying examination. Under these circumstances the Sanitary Institute has resolved to arrange examinations for the inspector of meat and other food, the syllabus to include the subjects specified in the report of the Royal Commission." Having seen that in the *British Medical Journal*, I wrote to the President of the Local Government Board in these terms :—

15th August, 1899.

Sir,—I venture to ask if the following statement in the *British Medical Journal*, 12th instant, p. 424, under "Inspectors of Meat and other Food," is correct :—

"The duties of a meat inspector can only be discharged by an inspector of nuisances or sanitary inspector," and further, if the recommendation of the Royal Commission on Tuberculosis, "that no person should be permitted to act as meat inspector until he has passed a qualifying examination," is correct? Do these two statements mean that holders of the diploma of the Royal College of Veterinary Surgeons are thereby not qualified to hold the posts of meat inspectors, or are members of the R.C.V.S. considered qualified without further examination by the sanitary or other institute?

Candidates for the diploma of the R.C.V.S. have now to pass a searching examination in meat inspection, and in hygiene, before they can obtain the diploma. I trust, Sir, you will favour me with an early reply, as this matter is of great importance to my profession,

I have the honour to remain, Sir,
Your humble and obedient servant,
W. OWEN WILLIAMS.

I received the following reply :—

Local Government Board, Whitehall, S.W.,
23rd August, 1899.

Dear Sir,—Mr. Chaplin desires me to acknowledge the receipt of your letter of the 15th inst., and, in reply, to explain that by section 116 of the Public Health Act, 1875, and section 47 of the Public Health (London) Act, 1891, the duty of inspecting meat devolves upon medical officers of health and inspectors of nuisances. No provision is made under the general law for appointing special inspectors of meat, and, where such persons are appointed they are appointed inspectors of nuisances (or, in London, sanitary inspectors) with the special duty of inspecting meat. Outside the area within which the Public Health (London) Act is in force, there is no statutory qualification for an inspector of nuisances, but the Board have to be satisfied that the person appointed is suitably qualified. Within the area, however, sanitary inspectors have to be qualified as specified in section 103 of the Public Health (London) Act.

Yours faithfully,
NOEL T. KERSHAW.

This really means that at the present time in London, veterinary surgeons are not recognised as being suitable persons to inspect meat, and that no one can inspect meat in the district unless he be a medical officer of health, an inspector of nuisances, or a sanitary inspector. It also states that outside of London local authorities may appoint whom they please to inspect meat—which is a most serious position for the veterinary profession to be in. If we are going to be excluded from inspecting meat and doing the duties which we consider are really ours, I am afraid the profession will suffer very much indeed—and I propose "that in view of the probable legislation resulting from the report of the Tuberculosis Commission, '*that in future no person be permitted to act as a meat inspector until he has passed a qualifying examination*,' this council appoint a deputation to wait upon the Local Government Board to urge the claims of veterinary surgeons as being fit and suitable persons to undertake the inspection of dairies, and of all live and dead animals intended for human consumption, and urge that the examinations of the R.C.V.S. be considered as qualifying for the duties of meat inspectors and inspectors of live and dead animals intended for human consumption."

Mr. SIMPSON, in seconding the resolution, said he thought it was highly necessary that the claims of veterinary surgeons should be brought to the notice of the Local Government Board, particularly having regard to the kind of examination which candidates would have to undergo at the sanitary institute. The questions were such as had to be answered by "B" students.

Mr. CARTER thought that the examination was not restricted to sanitary inspectors, for it said: "Candidates for the examination must hold a certificate of a sanitary inspector or inspector of nuisances from the Sanitary Institute or some other recognised examining body." He thought the R.C.V.S. examining body would come into that.

Mr. BARRETT asked if the R.C.V.S. had been recognised by the Sanitary Institute.

The PRESIDENT: I think not.

Professor WILLIAMS said he had written the following letter to the secretary of the Sanitary Institute:—

Dear Sir,—In the *British Medical Journal* of August 12th, p. 424, it states that your body has resolved to arrange examinations for inspectors of meat, etc., and further states that the duties of a meat inspector can only be discharged by an inspector of nuisances, or sanitary inspector. Will you kindly tell me if that means that veterinary surgeons who hold the diploma of the R.C.V.S. will have to become inspectors of nuisances, and then pass your examination, or that of some other examining body, before they can accept appointments as meat inspectors, or does the diploma of the R.C.V.S. stand good in lieu of your certificate? I shall be deeply obliged if you will answer the queries.

The reply was:—

Dear Sir,—In reply to your letter I enclose particulars for meat inspectors' examination arranged by the institute. At the present time in England the legal duties with regard to the seizure of meat and taking samples of food exposed for sale can only be exercised by a duly appointed sanitary inspector, and for this reason the regulation was inserted. I quite appreciate, however, the points you raise, and will bring the question before the examining body as soon as possible after the recess.

That was signed by the secretary of the Sanitary Institute, and was dated August 16th. There was another letter dated September 26th:—

The Sanitary Institute.

Dear Sir,—*Re* Meat Inspectors' Examinations. Your letter of August 15th has been laid before the committee, and I am instructed to say that it is proposed to add a clause to the regulations which will admit qualified members of the medical or veterinary professions to the examinations without any restrictions as to certificate as inspector or training.

Yours faithfully.

E. WHITE WALLIS, *Secretary*.

Mr. MASON thought that was only the expression of the opinion of the institute's council.

Professor PENBERTHY, in supporting the motion, said they were very much indebted to Professor Williams for the light he had thrown on the matter. It seemed that the Sanitary Institute would admit members and fellows of the R.C.V.S. to their examinations. They did not feel very much indebted for the kind permission. It behoved them at that point to do all that was possible, not only to secure work which was legitimately theirs, but to defend the public from anything like fraud. He hoped that that would be the keynote of any work which they might carry out. He had been asked during the last few minutes if he knew that already the examination of the Sanitary Institute had been acknowledged by the Local Government Board and the Board of Agriculture. They must not lose sight of the fact that in that syllabus there was a provision for the examination of animals during life which were intended for food, and that part of it, at any rate, from a professional point of view, they must resist to the utmost. The certificate was the first serious attempt which had been made to supplant the veterinary surgeon in his legitimate work. He need not recount that they had found it necessary to demand a four years' educational course, the whole of which led up to the important matters which were undertaken by the Sanitary Institute. That was a matter which should always be prominent in any argument which they had to bring forward, and inasmuch as the Board of Agriculture had also recognised, or was said to have recognised, the diploma of the examination of the Sanitary Institute, he thought that the Board of Agriculture should be included in their appeal.

The PRESIDENT understood that Professor Penberthy suggested that if the deputation be elected it should wait upon the Board of Agriculture in addition to the Local Government Board.

Professor PENBERTHY said that that was so. He would like to ask if the President had received from the Sanitary Institute a prospectus of the proposed examination direct from the Secretary.

The PRESIDENT: I have not.

Mr. ABSON requested that the resolution should be read again, which was done.

Professor PENBERTHY thought the resolution was not strong enough.

Mr. BARRETT agreed with that opinion, and suggested the desirability of adding the word "most" before "fit."

Professor MCFADYEAN thought that the word "only" would be better.

Professor WILLIAMS said he had altered the resolution so as to include the Board of Agriculture, and had added the word "only," so that it now read "as being the only fit and suitable persons."

Mr. BARRETT did not agree with the word "only." It was a very big subject, and it was being decided very hurriedly and casually. He was not sure that they were justified in assuming that attitude. The proposition now before the meeting involved this, that only veterinary surgeons should be appointed to those duties. Was the country prepared to submit to that? Was not the expense going to be enormous? He would certainly prefer the word "most," and would vote against the proposition if the word "only" was retained.

Professor MCFADYEAN did not quite understand what Mr. Barrett meant when he said that the expense of employing veterinary surgeons only as meat inspectors or as inspectors of live and dead animals would be enormous. It was probable that the expense of the inspection of all the animals and all the meat in the country by any class of persons would be enormous. He maintained that for any position of meat inspection which had yet been advertised in this country veterinary surgeons had been found willing to undertake the business, and he ventured to think that the veterinary profession was quite able to carry out all

the meat inspection and all the inspection of live and dead animals which was likely to be required for many years to come. He did not know whether Mr. Barrett had the courage to come there and say that he thought any other class of men at the present time had claims equal to veterinary surgeons as meat inspectors and inspectors of animals. If he had, it would perhaps have been useful to have mentioned them, because they would serve to bring out the fact that the overwhelming majority of the profession, with reason on their side, held a contrary opinion. They did not say that men could not be trained to act as meat inspectors without obtaining a diploma of the R.C.V.S., but they would require to undergo a training very similar, and equal in extent, and he thought it was highly improbable that any other class of men would fit themselves, as veterinary graduates were now fitted, to undertake work of that sort.

The PRESIDENT thought that Mr. Barrett's object was a diplomatic one—whether by using a less strong expression they could accomplish their purpose even better than by permitting the resolution to pass as it stood.

Mr. BARRETT moved as an amendment, "That the term 'only' be deleted from the proposition, and the term 'most' be substituted." He had never contended that members were unwilling to undertake the duties of meat inspection, and he was prepared to admit that veterinary surgeons were most competent to perform those duties. But if they adopted a resolution of the kind suggested, they were asking the country to go to an expense to which the country was not prepared to submit. Although they were assembled there as members of the veterinary profession, and as representatives of it, they ought to take a wider view, having regard to the progressive matters which engaged the attention of the nation. He thought they would defeat their object by passing a resolution of the kind, and therefore he had proposed his amendment. He was not prepared to go so far as to say they were the only body, and that only veterinary surgeons should be received. There were many matters in connection with meat inspection which in his opinion could be performed by other men. He admitted that veterinary surgeons were more competent than any other body, but the expense which would be occasioned by the wholesale appointment of veterinary surgeons was not one which the veterinary profession ought to ask the public to submit to.

Mr. SIMPSON said that he felt almost disposed to agree with Mr. Barrett that the substitution of the word "most" for the word "only" would be more acceptable to the Local Government Board and to the Board of Agriculture, and to the public generally. It was not quite so dictatorial, and it might be diplomatic. He suggested whether the mover of the resolution could see his way to accept Mr. Barrett's suggestion.

Professor WILLIAMS said that Professor McFadyean had stated that men might learn a certain amount of the knowledge which was required to be efficient as a meat inspector, and he would suggest, in order to meet both cases, that his motion be allowed to read—"the claims of veterinary surgeons as being the most fit and suitable person to undertake."

Professor MCFADYEAN said that if Professor Williams modified his motion, and substituted the word "most" for the word "only," he should feel it his duty to move the motion as originally put as an amendment, and to adhere to the word "only." It appeared to him that they were not there to coin phrases which were to prove acceptable to the Board of Agriculture and to the Local Government Board. They wanted to express their own opinion on the subject. They thought they had reason at their backs. They would rather that those bodies agreed with them, but they were not going to recede from the position they had taken up for years past.

Mr. WARTNABY said he would have much pleasure in seconding Professor McFadyean's amendment. It was not only a question of inspecting meat, but

of inspecting animals in health and in disease, and he maintained that the veterinary surgeon was the only man fit to do the work.

Mr. SIMPSON said it would be a pity if they divided on the matter. They all meant the same thing, and were working for the same end. He was willing to adopt either word.

Professor WILLIAMS said he understood that the various members of the council withdrew their suggestions, and that the resolution was to read—"the claims of veterinary surgeons as being fit and suitable persons to inspect." Neither the word "only" or "most" was required.

Mr. TRIGGER did not think that the council would carry any resolution which would prevent the appointment of sanitary inspectors acting as meat inspectors so far as this, that they should, before seizing or destroying any meat, or seizing any animal, call in a duly qualified veterinary surgeon. That was the most they had any right to expect. He was entirely of opinion that the veterinary surgeon was the only fit and proper person to decide whether meat was fit or unfit for human food, and certainly to examine the living animal. But he did not think they gained their end quite sufficiently if it were left as it was now, in most towns, that the sanitary inspector, on seizing meat he considered unfit, was bound to call in a veterinary surgeon. (Cries of "No, no.")

Mr. TRIGGER: He does do so.

Mr. MULVEY said he might do so if he pleased, but he was not bound to.

On the motion for the insertion of the word "only" being put, it was carried, 17 voting for and 1 against.

The resolution, with the insertion of the word "only" and in the inclusion of "the Local Government Board," was agreed to.

The following committee was nominated and elected:—

The President, Professor W. O. Williams, Mr. Simpson, and Professor McFadyean.

The SECRETARY read a letter from Professor Edgar enclosing a circular letter received by him from the editor of a periodical requesting contributions, and offering to include his name in a register of veterinary surgeons, so that readers of the paper could be advised to apply to him when needing professional services. Professor Edgar wrote stating that he considered the whole thing suggested an exceedingly objectionable form of advertising. A letter was also addressed to the council by Professor Penberthy on the same subject.

Mr. TRIGGER said he had also received a copy of the circular-letter. He moved—

> That this council view with extreme disfavour the attempt to induce members of the profession to associate themselves with the special mode of advertising suggested by the editor of the *Stable and Kennel* in a circular-letter addressed to the members of the R.C.V.S.

Mr. ABSON seconded the motion, which was carried unanimously.

Presentations to the Library.

The SECRETARY announced that the following presentations had been made to the library:—Copies of the *Veterinarian* for three months, and the *Veterinary Journal* for three months; the *Journal of Comparative Pathology and Therapeutics;* a bound volume of the *Veterinary Record;* Prospectus of the Royal Veterinary College of Utrecht, and the Annual Report of the Society of Bacteriologists, India.

On the motion of Mr. WRAGG, seconded by Mr. MASON, a vote of thanks was accorded to the respective donors.

Finance Committee.

Mr. TRIGGER read the report of the Finance Committee, dated October 3rd, and moved its reception and adoption. The report stated that Mr. Trigger had been re-elected to the chair. The committee recommended that cheques be drawn to discharge the present liabilities, and the £4 4s. paid for the use of the room by the Victoria Benevolent Fund be refunded, as a resolution had already been passed that the institute should pay out-of-pocket expenses only.

Mr. ABSON seconded the motion, which was agreed to.

Registration Committee.

Mr. SIMPSON read the report of the Registration Committee, and moved its adoption. The report stated that Mr. Simpson had been elected chairman for the year. The committee considered the application of certain members for restoration to the register, their names having been removed in consequence of non-compliance with sec. 5, sub-sec. 4 of the Act, and they recommended the restoration of the names of Messrs. G. R. A. Cox and Thomas Kay on the usual terms. The committee had also considered an application by another member for restoration of his name to the register, but adjourned the case until the next meeting, requesting the applicant to attend. The solicitor had reported to the committee that a non-member had been prosecuted for using the words "veterinary surgeon," and had been convicted and fined £5 and costs ; but as there were no goods to distrain, a warrant for his arrest had been issued, but had not been executed, as the defendant had absconded. The committee recommended certain prosecutions for the use of the words "veterinary surgeon," assuming that sufficient evidence could be obtained. The committee had also considered complaints against members for advertising, in most of which undertakings had been given or promised. A registered practitioner had been directed to appear at the next meeting for using the words "Member of the R.C.V.S.," and another member to appear for advertising.

Mr MULVEY seconded the motion, and the report was adopted.

Examination Committee.

Mr. MULVEY read the report of the Examination Committee, and moved its adoption. The report stated that Mr. J. F. Mulvey was unanimously re-elected as chairman of the committee. The committee reported that the examiners' reports and letters had been read and carefully considered. With regard to Class A, it was recommended that no alteration or addition should be made in the biology section. The examination reports for the other sections, B, C, and D, were discussed, and the following recommendations were passed: (1) That so far as possible the examiners be not summoned to commence their duties on the Saturday, and that the resolution passed in 1896 be adhered to—"That an interval of three days be allowed to elapse between the written and oral examinations, so that the written papers may be delivered to the examiners in sufficient time to enable them to consider their awards." (2) That the secretary be instructed to write to the "Fellowship" examiners to enquire whether a candidate's essay was rejected on the simple ground that the subject was an unsuitable one, or whether it was rejected on the ground of inadequate treatment of the subject. The committee had also received and considered letters dealing with the examinations. The committee suggested that the council again call the attention of the examiners in biology to the fact that the candidates might select any four of the questions set, and that it was not necessary to select two on zoology and two

on botany. The committee also recommended the acceptance and rejection of certain educational certificates.

Mr. WRAGG seconded the motion, which was agreed to.

Steel Memorial Committee.

The SECRETARY read the report of the Steel Memorial Committee, which stated that Professor McFadyean had been unanimously elected as chairman. The committee selected the names of those to whom the medals should be awarded, and upon the ballot being taken, Principal McCall and Professor Hobday were elected. The committee therefore recommended to the council that those gentlemen be each presented with the medal.

Professor MCFADYEAN moved the adoption of the report.

Mr. MASON seconded the motion, which was agreed to.

Report of the Court of Examiners of July Examinations in London.

The SECRETARY read the report, from which it appeared that in Class A 40 students were examined, 23 of whom passed and 17 were rejected. In Class B 38 were examined, 31 of whom passed and seven were rejected. In Class C 34 were examined, 28 passed and six rejected. Class C, practical, three examined and three passed. With regard to Class A examination (veterinary), Lieutenant-Colonel Walters, the chairman, stated that the examiners in biology considered the system recently adopted in written examinations of setting the questions in botany and zoology alternately upon the paper was against the spirit of the examination, and was prejudicial to its best interests, as it admitted of the selection of three questions in either section, leaving only one in the other to be attempted. Such an irregularity had occurred in several instances during the recent examinations in London and Scotland. The examiners were strongly of opinion that as the two sections of biology must be considered to be of equal value, students should be compelled to attempt two questions in each as heretofore.

On the motion of Professor MCFADYEAN, seconded by Mr. TRIGGER, the report was referred to the Examining Committee, as usual, without discussion.

Appointment of Examiners for the Walley Memorial Prize.

Mr. TRIGGER moved that the appointment be an honorary one.

Mr. MASON moved, as an amendment, that the railway fares of the examiners be paid, and nothing else.

Professor WILLIAMS seconded the amendment, which, on being put, was lost, and the original motion was carried.

On the motion of Professor MCFADYEAN, seconded by Mr. MULVEY, the examiners for the membership examinations were appointed examiners for the Walley Memorial prize.

Date of Professional Examination.

Professor MCFADYEAN moved that the written examination should be held on Friday, December 8th, and the oral on Tuesday, December 12th, in London, and in Scotland on or about December 15th.

Professor WILLIAMS seconded the motion, which was agreed to.

Date of Fellowship Examination.

Mr. TRIGGER moved that the next fellowship examination should be held in London on Monday, December 11th.

Mr. ABSON seconded the motion, which was agreed to.

Motion by Mr. Mulvey, re *Examiners' Fees.*

Mr. MULVEY said that his reason for bringing forward his resolution was that the examiners in the different classes were paid at different rates. In Class A the examiners received 18s. per hour, and the same in Class B, but in stable management they only received 15s. per hour. In Class C they received 18s. per hour, but in Class D final examination they were only paid at the rate of 10s. per hour. That seemed to him to require alteration, and he therefore moved "That the rate of payment in Class D final be 15s. per student per hour." In that class each student was taken for an hour. The examiners got 10s. and only examined six students in the course of the day, whereas in Class A they were paid 18s. per hour. He forgot how many students they examined.

The PRESIDENT: One every quarter of an hour.

Mr. ABSON seconded the motion. He thought it seemed a very invidious distinction that certain examiners should get 10s. per hour while others got 15s. and 18s.

Mr. TRIGGER had no intention of opposing Mr. Mulvey, but would like to know if he could not see his way to level down as well as level up. As chairman of the Finance Committee he knew that they could not afford to increase their examination expenses if it could possibly be avoided. Could Mr. Mulvey see his way to cut down the expenses, or alter the fees of any examiners getting the higher rate, and level the two in that way? He did not wish to oppose the resolution, because he did not think it was fair that any examiners should be paid less than others.

Mr. MULVEY said that could not be done except when the examiners were appointed. They were appointed on certain terms, and although they could be given more they could not be given less.

Prof. Mc FADYEAN did not think that it was made a condition of the appointment that any examiner was to be paid this or that sum. He would ask the secretary to correct him if it were the fact that any examiner stipulated that he should be paid a certain sum, or if he was informed in correspondence or in any other way that he would be paid any special sum. He would like to strongly support Mr. Mulvey's motion. It was a perfectly anomalous thing that the most eminent men in the veterinary profession, who performed what was certainly not the least important part of the examination, should be paid the least. If they worked six hours a day they would only earn £4 10s., which was, he thought, a very moderate sum. Of course, if a time came when they could not afford it, they would have to ask the examiners to take less, but they could not ask them to take less than any of their co-examiners.

Mr. MULVEY said that at the present time the Class A examiners received £5 8s. On each occasion when the examiners were appointed the scale of fees was sent to them.

Mr. TRIGGER asked the scale of Class A.

Mr. MULVEY: 4s. 6d. per student.

Mr. TRIGGER: And the others 10s. per student?

Mr. MULVEY said that they were paid 10s. per hour, but it did not work out the same. He had given notice of an alteration of bye-law, and that was the reason why the matter had arisen. When the scale of fees was drawn up it was supposed that the examiners would take two students in an hour, bnt it was found impossible to carry out the work in that way, and hence they had been taking only one student.

Prof. EDGAR said they were told that the examiners were informed that the remuneration they received would be so much per hour.

Mr. BARRETT: No, so much per student.

Professor EDGAR said they had accepted the remuneration, agreeing

perfectly with the council's offer, and now the council proposed, before a new body of examiners were elected, to alter the remuneration. They wanted to lift up one, but not cut down another. The fairest thing of all would be to pay the examiners so much an hour, and if they worked five hours or ten hours they would get equal remuneration, assuming all their abilities were equal. He thought it was an unfortunate time altogether to make an alteration now, which ought to be done when the examiners were reappointed.

The resolution was then put and agreed to.

Obituary List.

The SECRETARY read the obituary list.

Mr. MULVEY said that Mr. Charles Hunting was for some time a member of the council, and it was only fit that a vote of condolence should be passed by the council and forwarded to his relatives. He would move that that should be done.

Mr. TRIGGER, in seconding the motion, said that the profession had heard with great regret of the death of Mr. Hunting, who was always held in high esteem.

The PRESIDENT: I may add myself that I think Mr. Hunting was an ornament to the profession, and we all very much regret his death.

The resolution was unanimously agreed to, and the council adjourned.

A special meeting was afterwards held for the purpose of considering certain standing orders. This was done in committee, the reporters being requested to withdraw.

SOUTHERN COUNTIES VETERINARY MEDICAL ASSOCIATION.

ON Wednesday, September 27th, a meeting of the association was held at the White Hart Hotel, Salisbury, when there were present Messrs. J. B. Tutt (president), of Winchester; J. T. King, Bournemouth; E. W. Baker. Wimborne; G. Parr and E. R. Harding, Salisbury; Professor Hobday, and C. Pack (hon. sec.), Lymington.

Shortly after arriving at Salisbury, the company paid a visit to the yard of Mr. G. Parr, where Professor Hobday gave a demonstration in oöphorectomy on a cow.

A return was then made to the White Hart Hotel, where a meeting was held, the president occupying the chair.

The minutes of the last meeting having been confirmed, letters were read from the following gentlemen regretting inability to be present: Messrs. J. S. Wood, Parkhouse; Harry Redford, Winchester, who was prevented from attending through the loss of his mother; J. Millward, Wincanton; Professor Pritchard, London; C. Radway, Radstock; Sir Henry Simpson, Windsor; J. B. Martin, Rochester; J. Golledge, Trowbridge; J. H. Gould, Southampton; Carter, Guildford; and Goodall, of Christchurch.

Votes of Condolence and Sympathy.

The PRESIDENT said he was unaware of the loss which Mr. Redford had sustained, and he should like to propose that they instruct the secretary to send Mr. Redford, sen., a letter condoling with the family in their great loss.

Mr. BAKER, who seconded, thought that inasmuch as Mr. Redford, senr., and Mr. Redford, junr., were old members of their association, it was only due to them that they should express to them how deeply grieved the association was to learn of the trouble they were suffering under.

Mr. KING supported the resolution, remarking that he personally very deeply sympathised with the family in their loss.

The vote was unanimously accorded.

Mr. BAKER said it also behoved the association to request the secretary to express to Mr. Goodall how deeply they felt for him in the accident he had sustained. Since their last meeting he had met with a severe accident, having fractured his thigh. Mr. Goodall was one of the most useful members of the association, and in addition to the good work he had done for the association he had done a great deal for the profession, and he was certain that they deeply sympathised with him in his trouble and affliction.

The resolution was unanimously carried.

Specimens.

The PRESIDENT produced the femur and pelvis of a colt, showing a secondary fracture, which took place at the time of an operation.

Mr. PARR handed round to the members a supplementary digit on the leg of a forest pony. The extra digit was closely examined by the members, Mr. Parr stating that he had secured the specimen while in the forest, the pony having died from strangles.

Another remarkable specimen was also produced by Mr. Parr, showing anchylosis of the lumbar vertebræ, and last two or three dorsal, with a large bony tumour directly under the 14th or 15th dorsal vertebra. The tumour was about the size of a goose's egg. Mr. Parr said the specimen came out of a hunter, which when eight or nine years old jumped a fence and dropped into the road, which was deeper than the rider thought. He was called to the case, diagnosed it, and treated the animal, applying hot blankets, and subsequently a blister. The animal recovered in about six weeks, and was hunted again six weeks after the accident. The horse gradually became hollow backed, but carried the weight all right. He was called in to see it at the end of the season, but did not do any more to it. It was given a summer's rest, and during that time it grew worse. It was again hunted last season, but navicular disease developed, and the owner decided to have the horse shot. The animal was taken to the Wilton Kennels, and he secured the specimen from there. The general opinion was expressed that the growth must have been there from the first, and that the accident had nothing to do with it, but it was generally admitted that the specimen was a most remarkable one.

Election and Nominations.

On the motion of Mr. BAKER, Mr. J. Stewart-Wood was elected a member of the association.

On the motion of the PRESIDENT, seconded by Mr. PARR, Messrs. Charles F. Hulford, Haslemere; W. G. Pakeman, Swindon; W. James Kewley, 20, Victoria Place, Eastbourne; E. R. Harding, Salisbury; and Jno. Hayward Gould, of Southampton, were nominated for membership.

A BRIEF COMPARISON OF THE VARIOUS METHODS WHEREBY HORSES ARE CASTRATED.

BY PROFESSOR HOBDAY.

Mr. President and Gentlemen,—It is not my intention to-day to go into the minute details of all the different methods by which horses are castrated: that would take up too much time, and it is the wish of your president that the paper shall be short in order to allow plenty of time for the demonstrations—nor do I intend to go into abnormalities, such as scrotal hernia, etc.

What I purpose to lay before you for discussion are certain conclusions arrived at as the result of observations made upon between 350 to 400 horses with the various kinds of instruments in general use. I shall ask you each to say what instruments you have given a fair trial, and what are the ultimate conclusions you have come to.

First with regard to the "standing" position, which has caused so much correspondence in *The Veterinary Record* at various times, particularly between the years 1894 and 1896.

Its originator for horses I am not quite sure about, but the operation is by no means a new one, as an ecraseur which I have here was used regularly in England on colts in the standing position 14 years ago. The gentleman who used it got the idea from America, and in *The Edinburgh Veterinary Review* for 1858-59 there appears an abstract from the *Journal de Médecine Vétérinaire*, giving a description of this method of operating as advocated by a M. Bouillard. That it appears now to have gained a firm foothold in England is largely due, I think, to the way in which it has been defended and kept before the profession by Mr. Barrett, of Nuneaton.

Those in favour of it claim as its advantages: (1) that the method of fixing is easy; (2) fewer assistants are required; (3) there is not the risk of injuring the back that there is in casting; and (4) that the operation is completed more rapidly and without so much distress to the animal.

Its opponents have called it an operation which is acrobatic, cruel, unsurgical, and dangerous to the operator. Theoretically, without having given it a fair trial, one would be inclined to side with the opponents, but when one has performed it a few times, one's views become much modified.

It is not acrobatic; in fact, the casting is often a much more acrobatic performance; there is no more danger to the operator that he gets when casting his colt, and as to the cruelty, it is true chloroform cannot be used, but the actual pain at the time of operating seems very momentary, and an expert operator can usually get it all ended before the colt is over its first surprise.

Compared with the operation when the patient is cast and chloroform not used, from the colt's point of view, given a smart operator, unquestionably the standing posture takes the preference.

With regard to its unsurgical aspect, it is true that one cannot disinfect the skin quite as thoroughly as when the patient is cast, but I do not think that the average operator expects to get healing of the scrotal wound without the formation of pus, and certainly there is not more pus after the standing operation than when the animal is cast. Although attempts have frequently been made to get immediate union of the scrotal wound, the idea has not made much headway, mainly because the results were not sufficiently satisfactory. I think that I shall be right in surmising that you all prefer a large scrotal incision to a small one, and that therein lies one of the secrets of a successful termination. Results are great factors in daily practice in making us choose what method we shall adopt, and those of the standing operation in the hands of the men who have given it a fair and extended trial have been excellent.

In London we always wash the scrotum and thighs with soap and water and some disinfectant, but I know that this is not at all the common practice, and the results reported do not appear in country districts to be any the worse.

As regards the risk to the operator, of course accidents may happen, and I have heard them frequently hinted at, but up to the present (I speak principally from an experience of colts castrated by students quite new at the operation) I have not seen anyone injured.

To secure the animal nothing more than a twitch (or at most a twitch and

blinds) is necessary, and for instruments one requires a knife and something with which the testicle can be excised so as to avoid harmful hæmorrhage.

For this latter purpose there is the choice of either the wooden clam, the ecraseur, or some form of emasculator. Of these, for bloodlessness and prevention of after hæmorrhage, the clam is the one which has given us the best results—its only inconvenience is that it requires to be taken off after 10 or 12 hours, and this may, if the owner or his man cannot be trusted to do it properly and with clean hands, necessitate a second visit. I have tried them with and without antiseptic dressings, and now always prefer the former, cutting off the parts underneath the clam either with a knife or serrated scissors at time of operating.

On the continent the testicle is frequently left hanging for five or six days, and I have seen the animal return to have it cut off in a mummified condition at the end of that time. I should have expected septic trouble to arise, but I was informed that death was quite a rare occurrence.

When the clam is removed on the following day the end of the cord should be tucked up into the scrotum.

The ecraseur and each of the varieties of emasculator upon the market have the advantage of removing the testicle at once, and thus often saving a second journey. If one has absolutely trustworthy instruments they are in that particular superior to the clam.

My experience of them for a while was in every way favourable; then with the same patterns of instruments, came a curious succession of troublesome cases in which there was hæmorrhage, frequently to an alarming extent. Possibly it was due to omission of some little detail in the manner of using, but I am inclined to think as well that there is some difference between instruments even of the same pattern. An enquiry amongst members of the profession in castrating practices shows me that similar views are held. On more than one occasion I have been told that when some trifling repair or alteration has become necessary, the previously trustworthy instrument has come back absolutely unreliable. Both ecraseurs and emasculators, instruments of apparently exactly the same shape and pattern, often give exactly opposite results as regards hæmorrhage. The two instruments that I had last time have been well tested, and were kindly lent by Mr. Martin, of Witham, and Mr. Jno. Young, of Braintree. I have to some extent lost confidence in my own.

I think that the artery contracts much better if cut straight across than if cut obliquely, and in choosing an ecraseur, always prefer one with a blunt-edged chain. The worst accident that I have seen up to the present has been that the animal has fallen or laid down; this particularly occurs with ponies, and they are sometimes troublesome on this account. Of course one must always be careful to examine the scrotum for hernia before making any incision.

For operating upon the animal in the recumbent position one can choose the clam and iron, torsion forceps, the ecraseur, an emasculator, a saw to scrape through the cord, the wooden clam, or the ligature. The wooden clam is open to the same disadvantage already mentioned; it has to be removed after some hours. The saw, I have been informed by Mr. Engel, an Anglo-Indian, is frequently used in some parts of India to scrape through the cord; during the time that he was a senior student at the college we castrated one six-year-old horse this way, there being not the slightest after hæmorrhage. This is my only experience of its use for the operation in the horse.

Of the ligature, too, my experience is confined to one case, a pony operated upon during this summer by Mr. Woodruff, one of our college tutors. There was an unusual amount of swelling, but with this exception the case did well. A short time ago, you will perhaps recollect Mr. Walker, of the A.V.D.,

published some notes, *The Veterinarian* speaking favourably of the success which he had had in India with this method of operating. There must, however, be some good reason why this, one of the theoretically most surgical methods of operating, has not found general favour in England.

Of the other methods mentioned the old-fashioned clam and iron and torsion instruments have given us the best results. With the ecraseur and each pattern of emasculator we have at some time or other had attention drawn by the owner to secondary hæmorrhage. The hæmorrhage may not have been at all serious, but some people naturally get alarmed at the sight of bleeding, and it necessitates a second journey on the part of the practitioner, often at night, to find probably on arriving at the stable that the hæmorrhage had ceased.

The accidents that I have had the mishap to witness when the animal has been cast have been fractures of the spine and femur; doubtless you will tell me of others.

Conclusions.

The conclusions I have come to are :—

1. That there are numerous ways of castrating by which a large percentage of successful results may be obtained.

2. That the operator must suit himself to circumstances in making his choice.

3. That in the standing posture the clam, although perhaps not quite always the most convenient, gives the greatest safety from hæmorrhage, either at the time or afterwards.

4. That in the recumbent position the clam and iron, or the use of torsion instruments, give the least danger from hæmorrhage, although after the former there is more swelling than after other methods.

In mentioning these conclusions I should like to make it clearly understood that I do not wish to in any way speak disparagingly of the value of the ecraseur and emasculator, but merely to state what has been my own experience in trying the different instruments, and to ask you to let me also get in return a discussion and interchange of opinions.

THE CENTRAL VETERINARY MEDICAL SOCIETY.

THE annual general meeting was held on Thursday night, October 5th, at the Royal College of Veterinary Surgeons, 10, Red Lion Square, Holborn, Mr. Sutcliffe Hurndall, the president, occupying the chair. There were present: Messrs. Barrett, Baxter, Butters, Clarke, Colonel Duck, Colonel Durrant, P. J. Hagmaier, Humphries, MacCormack, Macqueen, W. S. Mulvey, W. E. Murtz, Major Nunn, Perryman, Pritchard, Reekie, Rowe, Savournin, Slocock, Smith, Stroud, F. W. Wragg, and one visitor.

On the motion of Mr. WRAGG, seconded by Mr. BUTTERS, the minutes of last annual meeting were taken as read.

Letters and telegrams from Professor Hobday, Mr. Nye, and Mr. Porch, expressing regret at inability to attend, were read; also letters from Mr. E. M. Jarvis, of Victoria Road, Kensington, and Mr. F. R. Stevens, of Redhill, Surrey, tendering their resignations, the former on account of removal from London, and the latter because of distance, which in both cases would prevent attendance at the meetings of the society. The resignations were accepted with regret.

Mr. BARRETT, on behalf of the Victoria Benevolent Fund, said that his committee extremely appreciated the action of the council of the C.V.M.S. in voting the sum of £50 towards their funds, and further mentioned with

reference to the charge of £4 4s. (for hire of room) made by the Finance Committee of the Royal College of Veterinary Surgeons that he had approached the committee in question on the subject, pointing out that the charge might be remitted, which they had kindly consented to, and had since forwarded him cheque for the amount. He felt the decision of the Finance Committee was largely due to the good offices of Mr. Wragg, whom he took this opportunity of thanking.

Professor MACQUEEN said if he was not out of order he would like to make a statement with reference to his attendance at the Blackpool Conference, but the CHAIRMAN said that an opportunity would be given at the November meeting of the society for the delegates to the various conferences to report regarding same.

The following report of the council for the past session was unanimously adopted :—

Annual Report—Session 1898–9.

Mr. President and Gentlemen,—The council has much pleasure in reporting that the session 1898–9 has been a most successful one.

During the year 16 new Fellows have been elected, but it is to be noted with regret that the following gentlemen resigned :—Veterinary-Major Spooner, and Messrs. Blake, Hulford, M'Fadyean, Penberthy, and Gray.

Ten ordinary and four council meetings have been held. At the ordinary meetings there has been an average of 30 Fellows present each evening. At the annual meeting in October Mr. J. S. Hurndall was elected president, and Messrs. J. A. W. Dollar, W. Mulvey, R. Porch, and Veterinary-Major Phillips, vice-presidents.

The council consisted of the following :—Messrs. W. Hunting, Professors Hobday and Macqueen, Veterinary-Major Nunn, W. Perryman, H. A. McCormack, W. E. Taylor, W. F. Barrett, A. L. Butters, H. W. Caton, and F. O. L. Walpole, with Messrs. A. L. Butters as treasurer, W. S. Mulvey as secretary, and Messrs. Garry and Savournin as auditors.

In November Mr. J. S. Hurndall gave the presidential address, followed by the annual dinner, at which there were 39 Fellows and seven visitors.

During the year papers on the following subjects have been read and the discussions were well maintained :—

1. Antiseptic Surgery, by Mr. Flook.
2. Burns and Scalds, by Veterinary-Major Nunn.
3. The Sale of Horses considered from a Legal Standpoint, by Mr. W. F. Barrett.
4. Rinderpest, by Mr. Stapley.
5. Docking, by Mr. Clapp.
6. Some Diseases of the Rectum, by Veterinary-Major Nunn.
7. The Need of Legislative Control of Bovine Tuberculosis, by Mr. W. Hunting.

The council is indebted to Messrs. H. Simpson, Sampson, and Major Phillips for interesting specimens exhibited, and for the history which was given in each case, but it is a matter of regret that so few cases of interest are reported at the society's meetings.

The receipts during the session have been £111 15s. 6d., and the expenditure £98 6s. 8d.

The society appointed delegates to the respective congresses held at Baden-Baden, Southampton, and Blackpool, and was represented by Mr. Hurndall, Butters, and Macqueen, and it is understood their reports will be laid before the society in due course.

The names of eleven Fellows whose subscriptions were three or more years in arrear have been struck off the roll.

Balance Sheet—Session 1898—9.

Dr.	£	s.	d.	Cr.	£	s.	d.
To Balance brought forward	82	1	2	By Hire of Rooms ..	5	15	6
Subscriptions	85	1	0	Hire of Rooms for Victoria Benevolent Fund ..	4	4	0
Two Life Members ..	22	0	6	Delegate to Dublin ..	5	5	0
Dividends (Consols £100)	2	15	0	„ „ Baden ..	20	0	0
Sale of Instruments ..	1	19	0	„ „ Southampton	1	10	6
				Printing, etc. (old a/c) ..	16	1	3
				Printing, Postage, Stationery, etc.	12	7	0
				Dinner Expenses	12	12	0
				Reporter	16	13	0
				Treasurer's Expenses ..	1	16	8
				Secretary's Expenses ..	2	1	9
				Cash in hand of Secretary	2	18	3
				Balance in hand	92	11	9
	£193	16	8		£193	16	8

September 30th, 1899.

J. Cozens Garry, L. Savournin } *Auditors.*

In reply to a query from Professor Macqueen, the honorary secretary stated that the item £16 1s. 3d. on balance sheet was for an old standing printing account, incurred before his term of office.

Some discussion took place with regard to the item of £4 4s., the amount paid on behalf of the Victoria Benevolent Fund for hire of rooms, and which sum Mr. Barrett had already mentioned had been refunded to the Veterinary Benevolent Fund by the Finance Committee of the college.

It was pointed out that the amount referred to would appear on the next balance sheet of the Central Society as a receipt, which would put matters right.

Election of Officers.

Messrs. Walpole and Harrison were appointed scrutineers in connection with the ballots for election of officers.

Mr. Wragg: I beg to move that Mr. Matthew Clarke be elected president. He is a member of old standing, and is in every way suitable for the position.

Mr. Villar: I have very great pleasure in seconding the motion. Mr. Clarke has been a member of this society for very many years, has a large experience, and, I feel quite sure, would fill the presidential chair ably and genially.

The Chairman (Mr. Hurndall) resuming, said: It affords me very great pleasure to hand over to Mr. Matthew Clarke a position which I have occupied with considerable personal enjoyment, due in no little degree to the cordial support given to me by the members. To-night, of course, brings my presidential term to a close, but the honour conferred upon me does not end with it. I feel that to occupy the presidential chair of this society is certainly only second to being President to the Royal College of Veterinary Surgeons. I have no doubt at all that my successor will feel, as I have done, that the honour is by no means a small one. Mr. Clarke, I have very much pleasure in asking you to take the chair.

Mr. Matthew Clarke (president) then took the chair, at the same time stating that he felt highly honoured at his election to the presidential chair, which was quite unexpected. He said he was afraid he would find it rather

difficult to follow in the footsteps of Mr. Hurndall, who had rendered them such capital service, but he would do his best, and trusted that the members would at all times give him their cordial support.

Mr. BARRETT: I think it is the first duty of some member of this society to move a vote of thanks to the late president. I have much pleasure in doing this. Mr. Hurndall, who has been a member for many years, has held the position of president with honour to himself and to this society. You are all aware that certain difficulties arose at the outset of Mr. Hurndall's occupancy of the chair, owing to his candid expression of opinions which he then held and presumably still holds, and it is to be regretted that in consequence one or two resignations took place. The members generally, however, considered it their duty to stand by the president, who had been elected with unanimity, and to support him in the chair, which I think he has filled with dignity, and at the expiration of twelve months I consider we have reason to be more than satisfied. I have much pleasure in proposing that a hearty vote of thanks be accorded our late president.

This was seconded by the CHAIRMAN (Mr. Clarke) and carried with acclamation.

Mr. HURNDALL, in reply, said: I appreciate very highly the expression of thanks which has been proposed and adopted by you for the fulfilment of the duties of president by myself. When I look back to the time when I received intimation that I had received this honour at your hands, I can hardly believe that twelve months have elapsed. It has passed away more rapidly than any other similar period that I can remember. I can only say that, through your kindness, it has been a most pleasurable period. I thank you most heartily for the support given to me while in the chair, and with respect to the one or two differences previously referred to by Mr. Barrett, I think they are now a thing of the past, and no one will regret that I have occupied the chair for a session.

The elections were then proceeded with, the following four gentlemen being unanimously elected vice-presidents: Major Nunn, Colonel Durrant, Professor Pritchard, and the late president, Mr. J. Sutcliffe Hurndall.

Twelve gentlemen had next to be elected to constitute (with the officers) the council of the society, and a ballot resulted in the following being elected, in the order named: Messrs. W. Hunting, S. Villar, W. F. Barrett, Professor F. Hobday, H. Reekie, L. Savournin, J. Rowe, R. Porch, W. Perryman, S. H. Slocock, J. A. W. Dollar, and F. O. L. Walpole.

The honorary treasurer, and secretary, on the motion of Mr. HUMPHREY, seconded by Mr McCORMACK, were unanimously declared re-elected, and thanked for their valuable services during the past session.

Professor Macqueen and Mr. L. Savournin were duly appointed auditors for the current session.

It was unanimously resolved to leave the arrangements for the forthcoming annual dinner in the hands of Messrs. Wragg and Sheather, together with the president and secretary.

Votes of thanks to the scrutineers and chairman concluded the proceedings.

LANCASHIRE VETERINARY MEDICAL ASSOCIATION.

THE usual quarterly meeting was held at the Grand Hotel, Manchester, on September 7th, when there were present: Mr. J. McKinna, president, and Messrs. H. D. Chorlton, E. Faulkner, Henry Hall, A. Kerr Hart, T. Hopkin, J. W. Ingram, W. Kendall, S. Locke, H. Locke, hon. sec., A. Lawson, E. H. Stent, W. A. Taylor, and J. B. Wolstenholme, of Manchester; A. Munro, Altrincham; W. Noar, Bury; J. H. Carter, Burnley; R. C. Edwards, Chester; R. O. Stafford, Crewe; Ernest S. Gubbin, Hyde; R. Hughes,

Oswestry; W. G. Dixon, St. Helens; A. M. Michaelis, Stockport: Ferguson, Warrington; and Wm. Woods, Wigan. The visitors were: Messrs. J. R. Green (Midland V.M.A.), C. H. Harrison, R. Scott, J. K. Leyland, M. Williams, J. A. Dixon, and H. A. Turner.

Apologies for absence were received from Messrs. Jos. Abson, J. P. T. Carter, and G. Howe.

On the motion of Mr. S. LOCKE, seconded by Mr. J. H. CARTER, the minutes of last meeting were taken as read.

The PRESIDENT pointed out that the matter of the congress at Blackpool on the 21st instant remained unconsidered, but that if it were the desire for the Association to be represented at the Congress there was still time to negotiate.

Mr. FAULKNER, considering it imperative that they should be represented, proposed that the President should attend the congress and that his expenses be borne by the society.

Mr. CARTER seconded the proposition, which was carried unanimously.

Mr. WOLSTENHOLME reported upon his and Mr. H. Locke's visit to the International Veterinary Congress, and paid an excellent tribute to the generous hospitality of their foreign *confréres*. About 1,000 delegates attended, comprising probably 20 English and Colonials, 12 Belgians, and the remainder Germans and Frenchmen.

The PRESIDENT alluded to the Sanitary Institute examination, and asked whether the society would co-operate with, or oppose, the institute.

Mr. CARTER said he was pleased the president had brought the matter before the meeting. The association should frame a resolution strongly protesting against the action of the Sanitary Institute, when the other societies would, no doubt, follow.

Mr. WOODS then moved the following resolution :—

> That this society views with regret the attempt of the Sanitary Institute to inaugurate a *quasi* veterinary examination which must be impossible for anyone but a veterinary surgeon to pass, or else must be of such a character as to render it a complete farce, and calculated to mislead the public.

Mr. FAULKNER seconded the resolution.

Mr. WOLSTENHOLME said he would have preferred that a paper should have been read on the subject, followed by a good discussion, before coming to any decision. No one present would, he supposed, suggest that such a man as the Sanitary Institute proposed to create by their examination was less capable of performing the duties of meat inspection than those who had hitherto done it, for any policeman, whatever his previous vocation, and whose only recommendation was that of some friend on the local board or town council, had up to the present been considered quite a fit person to perform the duties, and he (Mr. Wolstenholme) failed to see how a proper inspection of meat could be secured while the present method of killing in private slaughter-houses was tolerated by the public. What was really wanted was a loud outcry on the part of the veterinary profession, supported by the medical profession, against the cruelty practised in private slaughter-houses, and a demand for the substitution of public abattoirs. Of course, in the less populous districts, where it would be too expensive for each little community to have its public abattoir, they could combine and have one common abattoir.

Mr. FAULKNER: It seems to me that the work we have undertaken for years in agitating for public abattoirs, and efficient inspection of meat by those most competent, viz., the veterinary surgeons, and the education our students have, of late, been receiving to bring them into line with the every-day requirements of meat-inspection, is all going to be destroyed by one blow if the proposal of the Sanitary Institute is to be carried. It is simply absurd

to expect such men as that institute proposes to create by their examination to be educated to efficiently carry out the duties of meat inspection. The resolution carried at Baden-Baden, to my mind, touches the matter. If these men were only utilised in a certain way under the control of a superior officer —the veterinary surgeon—then all right; but to give them the education proposed by the institute is really, I think, foolish. It is a matter that would be no worse for being fully considered and thrashed out rather than being rushed; but, at the same time, I believe that this is retrograde as regards our profession, and it ought not to be carried out.

Mr. HUGHES: I think the same as the others—that if you create this new individual he will soon tell you that he is a superior officer to the veterinary surgeon, and will claim a special knowledge to pronounce an opinion on the subject at issue, and it is impossible to have a proper inspection of meat until we emphasise the opinion that there is urgent need of public abattoirs all through the country. If this man possessing this diploma is allowed to go into court before the magistrates, he will have a *locus standi* at once. I think we should speak emphatically and without doubt as to the advisability of creating this new degree.

Mr. HOPKIN: Do you not think that the council of the Royal College ought to take this matter up?

The PRESIDENT: Yes. We are entitled to the examination of the carcase and of the living animal so far as it is destined for food. That ought to remain to us, and we should all fully endorse this, but, I think, as an association, we are powerless to do anything unless the Royal College take this matter up, and they ought to defend our position.

Mr. FAULKNER: I was going to suggest that, if this resolution is carried unanimously, we might send it to the Royal College and ask the president and council to give it their serious consideration as the outcome of the feeling of this meeting, and urge them to take any steps they may think desirable, under the circumstances, as would be advantageous to us.

Mr. S. LOCKE: I think that would be the better course. I feel strongly on this point, and should certainly vote for the resolution proposed by Mr. Woods.

Mr. W. A. TAYLOR: I have much pleasure in supporting the resolution proposed by Mr. Woods, on the understanding that it shall be sent to the Royal College at once, to whom we should look for protection, inasmuch as they have granted diplomas qualifying us to practise as veterinary surgeons, and I look upon this new examination as an attempt on the part of the public to defraud us of that to which we have an inherent right.

Mr. LAWSON: As one of the members (for this district) of the council of the R.C.V.S., I have read this proposition of Mr. Woods, and shall take great care that it is brought before the Royal College, when I will assist it as much as I possibly can.

The resolution, with the amendment that it be forwarded to the Royal College of Veterinary Surgeons, was carried unanimously.

CONFORMATION IN ITS RELATION TO DISEASE AND UNSOUNDNESS IN THE HORSE.

BY R HUGHES, F.R.C.V.S.

Mr. President and Gentlemen,—When asked by our worthy secretary to prepare a paper for discussion at this meeting I consented solely from a sense of duty as a member of this Association, and not from any feeling that I would have anything original to bring before you. Indeed I must apologise for having been such an indolent member, and so long in making an effort to provide a subject for discussion. The selection of a subject has been a

perplexing one, inasmuch as it is almost impossible for an ordinary practitioner engaged in a busy practice to conduct exhaustive experiments and be able to entertain his audience with original matter in these days of minute scientific research. However, my opportunities for observations in an important breeding district prompted me to call your attention to "Conformation in its Relation to Disease and Unsoundness in the Horse." It does not take a very keen observer to recognise that conformation plays an important part in the causation of some diseases and unsoundnesses.

"Like begets like" is an admitted fact, and if animals of a faulty conformation are used for breeding purposes the natural consequence is that some of their bad points, as well as the good ones, are transmitted to their offspring. We have indisputable proof that colour and markings are readily transmitted, and those of us that have known renowned sires used in our district can recall many instances in support of this. Amongst the shire horses, take for example old England's Wonder, transmitting his peculiar roan colour to a very large percentage of his offspring; Carbon its characteristic shaped head and ears; Bury Victor Chief, Regent II., and the famous thoroughbred Sir Albert Victor, their peculiar markings; therefore if colour and markings are so uniformly transmitted it is equally natural to expect peculiarities of conformation to be subjected to the same law. That is the value attached to our stud and herd books—to maintain the purity of the breeds and the continuity of their good qualities.

If we take heredity to mean "the capacity of every animal to produce other individuals of a like kind" we must accept the certainty of conformation to be transmitted in equal proportion to other peculiarities in the parents.

Environment doubtless plays no inconsiderable part in determining development. We have to consider the influence of different soils, etc., as to the growth and conformation of feet and limbs, meadow and hill pasture, forcing for early maturity, management as bearing upon temperament of the animal, etc.

I am not going to theorise upon the parts played by the sire and dam in the reproduction of their species, but simply state that according to my experience I have observed that size and outward conformation are chiefly transmitted by the sire, and according to the conformation of his frame so it will be to a large extent in the offspring.

If we took a general view of conformation as an indication of stamina and robustness of constitution it is a pretty reliable guide. Take, for example, a horse with a small sunken eye, a narrow and shallow chest, long, hollow back, with a narrow, slack loin, and especially if associated with a badly expressed colour, we may predict such an animal to be a delicate feeder, a bad stayer at his work, and if at all pressed diarrhœa and fatigue are easily induced; and further, if he is ill from any debilitating disease recovery is slow and often unsatisfactory.

To what extent conformation is responsible for the development of certain disorders it is difficult to ascertain with certainty, but we have frequently observed that a horse with a defective conformation at any given point is especially liable if incautiously worked, and wear and tear be persisted in, to fail in that part.

When consulted as to the fitness of animals for breeding purposes, it is important that we should recognise the relationship between the conformation and the general utility of the animal. It may be said of a horse as of a chain—that its maximum strength is that of its weakest point, *e.g.*, take a horse with a fine and well developed body, supported by weak and badly formed legs, owing to the disproportionate weight and substance the undercarriage will wear out sooner than they would otherwise do. Again, a strong, powerful forehand is a great disadvantage if the hind quarters are weak and the

propelling power is deficient, and *vice versa.* Weak forelegs will suffer from excessive propulsion if the hind quarters are excessively powerful, and in each case the conformation will prove an important factor in the development of some disease or unsoundness.

In directing special attention to certain organs or parts of the horse we will commence with the mouth. I am satisfied that certain irregularities of the molar teeth arise from a faulty conformation of the mouth.

A horse with a "parrot" mouth is often troubled with irregularities of the molar teeth, particularly the upper anterior and lower posterior molars. From want of true apposition of the masticating surfaces, elongation of the non-wearing parts takes place, which sooner or later leads to imperfect mastication of the food, and requires surgical interference periodically to enable the subject to maintain health. Likewise a disproportionate width between the upper and lower molars brings about a bevelled and distorted condition of the tables and renders operative measures a necessity.

I am not aware of any disease specially due to a peculiarity of conformation of the head and neck. Although some authorities think that a long, well-turned forehand predisposes to "roaring," I cannot support this view, having observed the affection in the extremes of conformation. From what we know of the neuropathic origin and the hereditary character of the disease the most probable theory is that those horses with beautiful forehands had only inherited the conformation of their parents similarly affected.

There is a conformation of the shoulders that is frequently very troublesome—what is commonly termed straight shoulders—where the scapula is perpendicularly placed, the spine and its tuberosity excessively developed, and associated with it a wasted condition of the antea spinata muscles. This conformation is specially liable to shoulder galls, and very difficult to cope with if we do not recognise the faulty conformation predisposing to it. I am further of the opinion that this conformation is sometimes the subtle cause of horses refusing to draw, from their inability to receive the weight on the proper weight-bearing part of the shoulders. Owing to the weight being received on the spine and its tuberosity the skin and cellular tissue over these parts become hypertrophied, tender on pressure, and ultimately we have an aggravated case of galled shoulders.

It is doubtful whether there are any diseases of the respiratory organs due to conformation of the chest, but in a narrow or shallow-chested horse we would naturally conclude that recovery from any lung affection would be more tedious and uncertain than in one with a good conformation of chest.

The digestive organs are in close relationship with conformation, we often witness horses with long hollow backs, narrow, slack loins, and short, back ribs the subjects of diarrhœa, and anorexia, and when such animals are troubled with impaction of the colon it frequently ends fatally. As regards the pelvis I often consider that eversion of the uterus is due to conformation, viz., a roomy pelvis with a relaxed state of the vulva and of the uterine ligaments.

As veterinarians diseases of the locomotory organs concern us most. Great many of them are hereditary, but many of them are due to conformation, and in that sense they are congential, *i.e.*, any peculiarity, abnormality, or malformation in existence or demonstrable at birth is congenital. In these organs we have the best proof that conformation has a close relationship with certain diseases or unsoundness, *e.g.*, calf knees predispose to spavin of the flexor tendons, owing to the excessive strain thrown upon them. Horses that turn their toes out and have large flat feet are specially prone to "striking" or "interfering," but this is also much aggravated by faulty action and shoeing.

Abnormally narrow, or weak and low heels, especially if the horse has long

weak pasterns and stands with his fore feet wide apart, are specially predisposed to "corns."

Ringbones, sidebones, and navicular arthritis are also connected with peculiarities of conformation.

In the hind limbs—especially the hocks—we have better examples of the close relationship existing between conformation and the development of certain diseases. Excessively straight (upright) or sickle-shaped hocks are frequently affected with "bog spavin," and a "tied-in hock," which is dependent upon a defective development of the lower portions of the hock and upper end of the metatarsus, is particularly predisposed to "bone spavin," especially if such a conformation of the joint is associated with powerful, broad, and well-developed hind quarters and thighs, which unduly exercise the weak, narrow hocks, and lead to disastrous results.

Curbs, again, to a very large extent, are the result of a faulty conformation. Curby-formed, "tied-in" and sickle-shaped hocks are specially predisposed, especially in young horses that are indiscreetly handled or overworked. The reason for that is a short os calcis, which acts like a lever and becomes unduly compressed by the forcible action of the extensor tendons.

Many more instances might have been cited in support of the intimate connection between conformation and unsoundness, but I have already wearied you enough; suffice it say that conformation is highly hereditary, and associated with a faulty outline, there is a special liability to injury.

In our capacity as experts in the examination of horses as to soundness, conformation must always command a very large share of our attention, because I hold that it is impossible to form anything like a satisfactory opinion without having regard to it. There are some, I have no doubt, who hold the opinion that we should not take cognisance of conformation; as long as no unsoundness exists, that is all that is required of us. I would ask those authorities if we can estimate the working capacity and usefulness of any horse without having regard to it—*e.g.*, what value can we attach to sidebones if we ignore the conformation of the feet and pasterns? Calf-knees and badly developed flexor tendons, curby-formed hocks, should always be noted, so also faulty conformation of stifles, although the animal is sound, in a carthorse.

Discussion.

Mr. LAWSON, in opening the discussion, expressed his obligation to Mr. Hughes for his paper, the half of which he had, unfortunately, not heard. It referred, he noticed, to mating—that is, finding a proper sire for a proper dam—and, going about the country as he did, he saw a great mistake was made by breeders not having the proper advisers to mate their mares. Could it not be suggested to the various county councils, or to the Government, that certain veterinary surgeons might be appointed for stated districts, who might be consulted, and could advise which horse would be suitable for particular mares? As to horses with long necks, his experience was that these, as a rule, went wrong in their wind. Had Mr. Hughes come across in his district horses with flat or pumice feet? The sidebone question, especially in cart horses, was a very curious one. Sidebones were rarely to be found in light horses. If they were, the animals invariably went wrong from them.

Mr. CARTER said he took no notice of cart horses with good open heels and good feet with a little sidebone.

Mr. S. LOCKE said they were all very much obliged to Mr. Hughes for his remarks respecting conformation. A practitioner, if he would give satisfaction to his clients, ought to be well up in conformation. Sidebones, in cart horses, did not as a rule do much harm, provided there was a good formed leg with good feet. On the other hand, if there was a narrow straight foot and straight pastern

he would not recommend a client to purchase horses of that kind, nor light horses that have to continually trot. Hunters with long necks were, in his opinion, suspicious with respect to being whistlers or roarers. There were other signs of conformation in which an adviser ought to be well up. Short backs, good deep heart ribs—shoulders in proper position. Horses with short ribs and long backs were not generally very good ones as hunters, or as shaft horses.

Mr. FAULKNER, after thanking Mr. Hughes for his paper, said conformation undoubtedly had a great deal to do with regard to disease and unsoundness in horses. Of course his experience in the town was not to be compared to that of Mr. Hughes, who had opportunities of observation in a large breeding district. The breeding societies had been, and were doing a lot of good, and conformation was more closely watched now in mating than hitherto to his knowledge. With respect to sidebones, he believed that, under favourable conditions, they were not troublesome. There was no doubt in regard to conformation of the neck and wind that many good judges of horses avoid those that had to gallop with an extra long neck.

Mr. TAYLOR said that conformation had a great deal to do, or ought to have, in the formation of a practitioner's opinion as to the suitability of a horse for his client's work. Did Mr. Hughes consider that a roach back predisposed an animal to any particular disease; and, if so, in what respect as regards a saddle or harness horse? Horses with long necks he (Mr. Taylor) regarded with suspicion. Had Mr. Hughes noticed, as to the width of the intermaxillary spaces in the lower jaws, that a so-called narrow lower jaw was prone to become unsound in wind? What did he mean by calf-knee? because some people considered that the calf-knee was somewhat "in-kneed," while others meant where the knee was in a backward condition. (Mr. Hughes: The posterior of the keee.) He could not say from actual experience that he had seen many cases of sprain of the flexor tendons. In that conformation he had known one or two hunters with it. They suffered from over-riding of the fetlock joint in addition to the standing back of the knee. Then, again, with regard to the stifle, he understood Mr. Hughes to say that a thin narrow stifle, and where the patella was not well "strung up" by the muscles and ligaments, there was some probability of the animal becoming unsound from disease or through work. In that condition of stifle, which he apprehended to fall under the category of straight stifle, he entirely agreed with Mr. Hughes's views. He always regarded such animals with suspicion for whatever work—for slow work, or nag, hunter, or thoroughbred. A very straight hind leg with a long pastern he always considered a great fault in conformation. With respect to sidebones, he should never recommend a client to buy a hunter with a sidebone, or a harness horse or a nag with one. Given a good foot, wide open heel, and plenty of horn, and the sidebone not too anteriorly situated, he would certainly advise a client to buy a horse—at a price to be agreed, of course.

Mr. HOPKIN said be doubted whether conformation played so great a part as environment, temperament, and disposition. Suppose half-a-dozen of the best race-horses were brought before competent practitioners, how many defects would they find? Any quantity. It was not from the conformation but from the performance, and they would find, on looking at a horse which had beaten its fellows, lots of faults with its conformation, whereas another, which was before its fellows in conformation, would, in performance, be only secondary. He doubted, unless it was the veterinary surgeon from the country districts, whether they were the best judges of what was suitable for breeding. The men who watched the foals from birth, saw their development, and learned their disposition and adaptability, would be more successful as breeders than the so-called experts, some of whom had made lamentable

failures. With regard to stifle lameness in cart horses, this was rarely seen in town. As to jibbing, this depended more upon the temperament of the animal than upon any conformation. Conformation played an important part in roaring. Respecting side-bones, he had been considerably struck with the trouble that some of the American horses had. Any bone affection or any bony deposition taking place in an American horse did seem to make most rapid progress. American horses with sidebones were dangerous subjects.

Mr. WOLSTENHOLME considered it a very rare thing indeed for horses to be lame with, or from, sidebones. Stifle lameness was extremely rare in cart horses, and when discovered could always be traced to some well-defined accident. For years he had been surprised that there had not been more stifle lameness, considering the pressure put upon the patella in the backing and starting of loads, but from his experience it was not common in cart horses.

The PRESIDENT thanked Mr. Hughes for his valuable paper, adding that he had no doubt whatever that conformation played a very important part in reference to disease and unsoundness in horses. Respecting sidebones, what a large percentage of Clydesdale horses had these, and yet the animals worked well, comparatively. He agreed with Mr. Hopkin on the question of environment.

Mr. LAWSON said he would like to know whether in Mr. Hughes' experience, from the breeding going on now-a-days, he thought there were fewer cases of horses with sidebones than there were some years ago. His experience during the last few years—and he had gone through a considerable number of cart horses—was that there was a marked decrease of horses with sidebones.

Mr. HUGHES, in responding, said there was certainly a most important and very interesting feeling with regard to the suitability of animals for breeding purposes. Representing an important breeding district as he did, he could say unhesitatingly that there was not so much sidebone now, and that was the result of educating the breeders. Since the commission sat, or inquiry was made into hereditary soundness, a voluminous amount of evidence was collected, and a schedule was formed scheduling certain diseases as hereditary. In his district they were very particular in the matter of mating. With a sire with an upright pastern, and especially with a small foot, he was quite sure that a large percentage of his progeny would have a similar conformation, and that conformation had a large bearing upon sidebones. To reject every horse as far as utility was concerned on account of sidebones, they in his district would have to reject as much as 30 per cent. perhaps. An upright pastern and a small foot, narrow at the heel, with the sidebone anteriorly placed—there was a source of danger. On the other hand a nice sloping pastern, with moderate dip, heel open wide, and the frog well developed, and the sidebones well placed, he did not think the sidebones would be troublesome.

Reference had been made to roaring. This, they knew, was much more common in large than small horses, and very common in racehorses. Its cause, or its chief cause, was heredity, and not one due to conformation. He did not deny that conformation had got something to do with it, provided there was an exciting cause. They were all agreed, he thought, as to the importance of conformation of the feet and the pastern, and also the situation of the sidebone, provided that such an animal had come to maturity. With regard to umbilical hernia, there were conditions affecting the fœtus as well as affecting the dam prior to birth, and he considered that hernia, either umbilical or scrotal, was due to accident or interference with development before the fœtus was born. It was very difficult to trace whether hernia was due to heredity or accidents in environment. The nature of the pasture and

food had an immense bearing on the subject both as regarded conformation of the legs and of the feet, and of their endurance in their work. Conformation of the shoulders (that is badly formed shoulders, in cart horses more particularly) was more or less hereditary. Odd feet were very common in thoroughbreds, and were undoubtedly hereditary.

On the motion of the PRESIDENT, seconded by Mr. TAYLOR, a hearty vote of thanks was accorded to Mr. Hughes for his able paper.

Specimens.

Mr. H. LOCKE exhibited a specimen of a ruptured œsophagus.

Mr. CARTER submitted a specimen of two fractured tibia of a black cob, and described the case as follows:—On June 19th I was called in to see a black cob, which the owner had been showing to a likely purchaser, and only a matter of £1 or £2 between the parties prevented sale. The owner drove away (and I fancy was doing a little showy performance on his own account) when he informed me that the cob commenced going dead lame from no accountable cause. It was then a question of putting up at the nearest available stable, so the animal was walked to the stables of the Burnley Carriage Company. I was at once sent for, and upon arrival I found the cob dead lame on the off hind leg. On careful manipulation of the limb from hip down to fetlock joint there was nothing particular to be felt, but on further examination I found a spot on the inner aspect of the thigh, which pitted slightly on pressure, and the animal evinced much pain. Upon walking out of the stable the animal walked on three legs and had great difficulty in getting back again. I informed my client I could not say what was the actual mischief, unless there was a partial fracture of the thigh, but, being twilight, would give no definite opinion, so had the animal put into slings and ordered fomentations and administered a dose of physic. The following day, June 20th, I found my patient much about the same, continued same treatment and visited again on the following day, June 21st, and found treatment was being neglected, so ordered those in attendance to walk the animal down to my place, and to be careful and let the animal take her own time, and rest whenever needful. Arrived all safe and placed in comfortable loose box, and put into slings. The treatment was continued until June 26th (six days from accident), when a man came down with a float and said his master wanted the mare at home, and that he was to take her back in the float. I told him he was very foolish, as the mare was certainly not fit to be removed, and that such a procedure would be attended with great risk, for if she went down I was afraid she would never rise again, but in spite of my entreaty he would take her, saying I could attend to her at his farm. He got the float in position and the door down. My assistant, who had hold of the halter rope at the time, wisely gave it into the hands of the man, who, taking hold, urged the mare to mount the slope, whereupon she endeavoured her best to do as bid, but as soon as she got her fore feet on the sloping door she was noticed to swerve on her hind quarters, and, before anyone could render assistance, down she came, with the result that she fractured both her tibia—comminuted facture. I at once dispatched her by placing my hand, per rectum, and making an incision into the posterior aorta. The bones produced are the tibia in question, and upon closely examining the distal extremity of each you will find them to be very brittle and of a chalky nature, proving the faulty nature of the bone substance, containing, in my opinion, a superabundance of lime salts and a deficiency of animal matter, hence the cause of fracture under the circumstances named.

Mr. CHORLTON exhibited a live dog, showing a fracture of the leg.

Mr. WOLSTENHOLME, for Mr. J. T. P. Carter, exhibited a specimen of the brain of a horse which had died suddenly from putting a twitch on.

A cordial vote of thanks was accorded the gentlemen who exhibited specimens, on the proposition of the PRESIDENT, seconded by Mr. LAWSON.

CONTAGIOUS DISEASES ANIMALS ACT, 1864 AND 1899.

SUMMARY OF RETURNS OF OUTBREAKS, for the four weeks ending October 14th, 1899.

ENGLAND AND WALES.

Pleuro-Pneumonia.	Swine Fever.	Glanders (including Farcy).	Rabies.	Anthrax.	Sheep-Scab (for month of September).
None.	Outbreaks 123 Slaughtered 1,885	Outbreaks 95 Attacked 155	Dogs 2 Other animals 0 Destroyed 1	Outbreaks 31 Attacked 52	Outbreaks 23

SCOTLAND.

None	Outbreaks 2 Slaughtered 20	Outbreaks 5 Attacked 9	None	Outbreaks 11 Attacked 12	Outbreaks 1

IRELAND.

None	Outbreaks 13 Slaughtered 352	None	Dogs 6 Other animals 2 Destroyed 20	None	Outbreaks 14

THE ANNUAL ADMINISTRATIVE REPORT OF THE CIVIL VETERINARY DEPARTMENT IN INDIA FOR 1898-1899.

THIS report is one of great interest, showing how much good work the veterinary professional men from home are doing in India.

The report consists of over 300 pages, and also contains several large maps of various parts of the country.

Williams' "Principles and Practice of Veterinary Medicine and Surgery" have been translated into Urdu, and is considered of "incalculable value to the veterinary assistants of the department." (At the same time the author's permission was not obtained for the translation, nor has he yet been notified that such had occurred.)

Veterinary-Colonel and Inspector-General Civil Veterinary Department, A. E. Queripel, sums up the report as follows:—

Last year it was with regret that I had to report a certain amount of retrogression, and I feared that it would be some time before this department recovered from the effects of famine, and the drain of mares caused by the Tirah Expedition. It is, therefore, with great pleasure that I can report that horse and mule-breeding have quite recovered from the above-named causes.

Three hundred and twenty-one stallions were employed at stud work against 314 last year. Fifteen thousand six hundred and ninety-four mares were covered, against 14,497 last year, and 15,152 in 1896–97, showing an increase of 1,227 when compared with last year. This must be considered very satisfactory.

48·84 mares were covered per stallion employed against 46·08 last year, and 48·17 in 1896-97. The averages in our large breeding centres were as follows:—

North-Western Provinces	49·10
North Punjab	53·31
South Punjab	50·92
Baluchistan	57·86

By the above it will be seen that all stallions covered the number expected of them.

Four thousand and forty-five foals were dropped, against 4,269 last year. This must be accounted for by the poor condition of mares caused by famine. This gives an average of 28 per cent. of successful coverings, and of 13 foals per stallion employed. Results, however, were not traceable in 1,548 cases; this would increase the above percentages were the results known.

One thousand seven hundred and sixty-three remounts were purchased, against 1,959 last year. This must be accounted for by the large number of Australian remounts purchased by regiments.

The cost of feed and keep fell greatly during the year under review.

The number of branded mares increased by 1,472. Three thousand and eighty-nine were branded this year against 2,784.

Three hundred and fourteen (314) stallions were employed at stud work against 291 last year. Eighteen thousand seven hundred and thirty-nine pony mares and 1,379 donkey mares were covered, against 17,159 and 1,148 respectively, showing an increase of 1,580 pony and 231 donkey mares.

64·60 mares per stallion employed were covered, against 58·84 last year, and 64·57 in 1896-97, showing that this industry has quite recovered itself.

Three thousand three hundred and eighty-two foals were known to be dropped against 3,637 last year, being a reduction of 255, caused no doubt by the bad condition of the mares during 1897-98.

The total number of animals present may be said to have been about what it was last year, whilst 2,000 more animals competed for prizes.

The good work done in the Native States is worthy of mention. One thousand seven hundred and sixteen mares were covered by horse stallions and 789 by donkeys, against 1,680 and 595 respectively during 1897–98.

Provincial.

The final examinations show the following results:—

	Percentage of students who were successful.	
	1897-98.	1898-99.
Bengal	93·33 ..	100·00
Lahore	88·03 ..	81·00
Bombay	50·00 ..	53·00
Rajputana	89·40 ..	75·00

The success obtained at the Bengal Veterinary College is most satisfactory.

This most useful adjunct to Imperial horse-breeding has proved a great success. During the year under report, 181 stallions were employed at stud work against 163 last year, while the number of mares covered rose from 8,420 last year to 9,724 this year. This is most satisfactory. The average number of mares covered per stallion employed rose in our three large breeding centres.

Two thousand three hundred and eighty-five foals are known to have been dropped against 2,204 last year.

I have attempted to show that horse and mule-breeding have recovered from the injury which they sustained through famine and the frontier expeditions, but I would draw special attention to the good work done by the officers of this department in connection with cattle. The amount of original research work which has been effected during the year under review has never been equalled since this department was formed, and I trust that the Government of India will recognise the zeal of the small band of officers who have striven to further the interests of the agricultural community.

Cattle breeding is receiving attention generally, and will be further considered when we are furnished with more officers.

These most useful institutions are extending, and during the year under review all have worked well, affording relief to the large number of 48,428 animals.

I have before pointed out that the value of veterinary assistants is not so much in the controlling of outbreaks and contagious diseases, for in dealing with these they can only advise, and their advice is more frequently than not refused: it is more in the treatment of the ordinary ailments of cattle that they are of value. I am, therefore, pleased to see a steady increase in the number of cattle treated by the subordinate staff.

The following statement will show the improvement which has taken place during the past four years:—

1895-96	111,723 cases treated.
1896-97	118,517 ,,
1897-98	157,214 ,,
1898-99	165,844 ,,

Again I have the pleasure to report that the officers of this department, one and all, have worked with zeal, and have evinced a desire to bring to a successful issue the work with which they have been connected.

It was with regret that I felt compelled to part with Vet.-Captain Gunn, who for the past four years has worked with me as assistant to the Inspector-General. His knowledge of cattle and their diseases, his zeal and energy, and his invariable willingness to carry out any work which might prove of interest, made him most valuable to me when dealing with the cattle section of this department, still I felt that when the re-organisation of the Hissar

Cattle Farm was confided to this department, it was necessary to ensure the services of the best officer available, and I look with confidence to the results which Veterinary Captain Gunn is likely to bring about.

It may seem invidious to mention any particular officers in a small department where all have done their best, but I feel compelled to bring to the notice of the Government of India the names of Veterinary Major Raymond and of Veterinary Captain Evans.

The former may be said to have done the work of three officers, for not only has he carried on the duties of the Bengal Veterinary College with marked success, but he has most efficiently supervised the general working of the department in the province, and in addition to this he has done a vast amount of original research work connected with rinderpest and with the hides of animals that have died of that disease.

In Veterinary Captain Evans the department possesses an officer with great powers of organisation and unlimited zeal and energy. The success obtained in Burma, in which province the organisation of the subordinate staff and the work done by it are far in advance of that in any other province, is entirely due to this officer.

My best thanks are due to all Local Governments and Administrations, and to the many district officers, for the ready help which they have afforded me, and I would beg to express my warmest thanks to Mr. Giles, C.I.E., Officiating Commissioner in Sind, for the assistance he has given me in placing horse and mule-breeding in that province on a satisfactory basis.

To the chiefs of the many native states which I have visited I would tender my warmest thanks for the hearty manner in which they have co-operated with me in the extension of horse and mule-breeding in their territories.

A. E. QUERIPEL, *Vety.-Colonel,*

Simla, *Inspector General, Civil Veterinary Department.*
9th August, 1899.

ROYAL INSTITUTE OF PUBLIC HEALTH CONGRESS AT BLACKPOOL, 1899.

CONFERENCE OF VETERINARIANS.

PRESIDENTIAL ADDRESS,

BY J. PENBERTHY, F.R.C.V.S., PROFESSOR OF MEDICINE, ROYAL VETERINARY COLLEGE.

FIRST, I beg to be allowed to express a very high appreciation of the honour of being placed in the distinguished position which I now occupy. Fully conscious of the privilege of being called on to take part in gathering and disseminating knowledge, which may lead to improvement of the public health, and so render the conditions of human life more favourable, I am sure we, as veterinarians, must receive a stimulus to the pursuit of the original and more direct objects of our special branch of medicine. The exercise of our special functions affords us precious opportunities for lessening the sufferings and preserving the health of the lower animals, and thereby conserving the national wealth. Sharing, however, the instincts of the human family, our

highest aspirations as members of the community lead us to regard the part we may have in the conservation of human health as our highest privilege and most sacred duty.

The business relegated by the council to this conference is the discussion of "Measures to be taken for the prevention of tuberculosis in the lower animals, and its spread therefrom to human beings." At similar gatherings for some years past an immense amount of consideration has been devoted to these matters, but the importance of tuberculosis and its prevention remains paramount, while we may safely admit that, concerning the nature of the disease and the attainments of the objects implied by the title of our discussion, finality has not yet been arrived at.

Tuberculosis still claims annually in Great Britain some 70,000 human victims, and is widespread among the lower animals. Medical science has, through much arduous toil, accumulated a large fund of information which awaits general, practical application. Details relating to some phases of the disease, and to methods of applying the knowledge available, may provide ground for debate. For amplification, there is every evidence of well-sustained and intelligent interest, and we anticipate for our subject valuable contributions in the form of papers and discussion.

It is, I believe, customary for those who occupy positions similar to that I have the honour to hold to inaugurate the proceedings by bringing under review the work done in recent years in relation to that branch of science to be deliberated on by the conference over which he presides. For many reasons, and not least the tax on your patience which would be entailed by the most cursory reference to a tithe of what has been done and said concerning tuberculosis and its prevention during the past decade, I would beg to be permitted to deviate from the ordinary course, and in a general way touch on some of those points affecting the question as it stands to-day.

I start with the assumption that any measures which may be suggested for the prevention of tuberculosis in the lower animals and its spread therefrom to man depend for their application on the public, and that the application of scientific knowledge for the public good can never be far in advance of public opinion. I take it that the main and most laudable object of this great congress is the education of public opinion, a task demanding both force and delicacy, and, beyond everything, guidance by true principles and scientific accuracy. To effect our purpose it is essential that in all our deliberations we bear in mind the absolute necessity for our statements being based on facts, our deductions well tested for corrections, and our suggestions practicable. In my humble opinion nothing is so likely to obstruct the application of special knowledge as the dissemination of crude and immature opinions, so many of which are doomed to explosion as baseless theories. Though perhaps not an unmixed evil, it is to be feared that the rage for publication of isolated so-called discoveries and immature information has had a deterrent effect on the progress of the crusade against tuberculosis in man and animals. The scare arising out of misrepresentation and exaggeration, the failure to fulfil a promise, do incalculable mischief, rendering doubly difficult the inculcation of sound views and retarding effective action which might be based thereon. The reason of the British public must be appealed to.

We want something solid to go on before we embark on serious enterprise. We are not an impetuous people, and, taken in the long run, though there may be at times an inclination to think we are far behind in the application of scientific knowledge, perhaps we may perceive that not infrequently our caution results in advantage to us. No one who has carefully watched the growth of knowledge on the matters in question can fail to admit that any national or legislative attempt to eradicate tuberculosis, based on the infor-

mation we possessed five years ago, or on the generalisations so freely indulged in at much more recent dates, must have been followed by failure. We believe, and I have little doubt that the deliberations at our further meeting to-day will show, that we are at the present moment infinitely more competent to deal rationally with the subject than we have ever been. It will come to me as a surprise if it is not the general opinion that further delay in the general application of measures is utterly inexcusable, and would reflect disgrace on a civilised country. Indeed, the prevention of tuberculosis in the lower animals, and its spread therefrom to human beings, rests not now with the medical profession, human or veterinary, but with the stockowner and the public, who are affected by its ravages. I take it no more favourable circumstances for influencing public opinion in the right direction could exist than under the auspices of such associations as this Royal Institute, where corporate bodies, sanitary authorities, learned societies, social leaders, medicine, engineering, architecture, and other cognate arts are represented, all manifesting a lively interest in public health, and in uniting forces against the common enemies of man's happiness. Had I decided to attempt to review the work of recent years, I could have pointed to no stronger evidence of the advantage accruing to it than the awakening of our sanitary authorities to the desirability of systematically attacking tuberculosis and preventing its spread from the lower animals to man. The domination under which our deliberations of to-day are to be carried out implies the general recognition that tuberculosis is a contagious disease which affects the lower animals, and is transmissible from them to man. Thirty-seven years ago Villeman proved that tuberculosis of man was transmissible to animals, and the disease so induced communicable to other animals. The view that animals were a source of danger was not accepted generally until the discovery of the bacillus in 1882 by Koch. Proof that the cause of tuberculosis in the lower animals and in man is identical now becomes easy, and soon it was accepted universally that the diseases are the same and the cause common to both. Within much more recent times statistics and alarmist deductions therefrom have been freely issued to the public by those in high places, and the view uncommonly held that tuberculosis was a disease special to catch but transmissible to man, *i.e.*, that man's tuberculosis was largely of bovine origin. From the terrible incriminatic of the meat and milk of this country, and the demands of many, who talked loudest and probably knew least, it would appear that the prevention of tuberculosis in man rested almost entirely with the Minister of Agriculture. The tendency of more recent pronouncements appears to be in an opposite direction. Naturally, the cognisance of the Minister of Agriculture is directed to conditions which affect our powerful industry—agriculture. The ostensible object of the Board of Agriculture in attempting to deal with tuberculosis would rest on the assumption that its diminution or eradication would improve the health of the stock of the country, and benefit the stockowner. What influences, or should influence the Board of Agriculture, should similarly affect the stockowner. The question therefore arises, does tuberculosis exist extensively, and does it materially affect the health of stock and bring serious loss to the stockowner and the national resources? Application of the tuberculin test shows clearly enough that 30 per cent. of our dairy cattle, and a considerable proportion of the rest of the bovine species, are the subjects of the disease. *Post-mortem* examination tells us that animals of other species, especially pigs, are often affected. Ordinary observation during life, and *post-mortem* examination, show that many animals, though the subjects of tuberculosis have not appreciably suffered during life, while the flesh of the majority

of animals reacting to tuberculin is, under proper regulations, fit for human consumption. It is not difficult to understand when it became generally known that in dairy and breeding stock an average of 30 per cent., and in some instances 80 per cent. or 90 per cent., reacted to the test, without analysis of the consequences and in view of the demand set up by a few alarmists for the immediate suppression of tuberculosis by the slaughter and destruction of all tuberculous animals, that stockowners became alarmed and disposed to reject the idea of any such radical procedure. The question of cost and compensation naturally arose. To slaughter every food supply animal shown by the tuberculin test to be affected with the disease would entail a fearful expenditure of money, and paralyse the breeding and dairying of the country, while there was not sufficient evidence to show that the object could be attained with the means at our disposal. I am disposed to think, if there were no reasons for doubting the success of the attempt, that, notwithstanding the cost and inconvenience, it should have been cheerfully borne by the country, and stockowners' loss recouped from the Treasury. We must not forget that but a short time since the confiscation of every carcase which harboured the smallest speck of tuberculosis was demanded. On the meat question scientific investigation and sober sense have been brought to bear, and at present it is generally believed that only in a comparatively small proportion of cases is the flesh of tuberculous animals dangerous to the health of man. Indeed, there is now a general consensus of opinion that with a sound system of meat inspection, carried out at the dictation of our present knowledge, the public health would be safeguarded with comparatively little risk to the public, the stock-owners, or the butcher. At the same time, many cases of hardship dependent on the irregular and incompetent method of inspection now obtaining would be avoided.

In the advanced state of our experience with tuberculosis it is, however, remarkable that there might appear in some quarters a tendency to bring forward arguments for delaying action. Opinions recently expressed on certain aspects of this question are made to appear heterodox when placed in comparison with views resulting from a superficial consideration of other results of the tuberculosis tests. I am disposed to think, however, that the inconsistence, if any, is more apparent than real. We dare not overlook the fact that, from the pronouncements even in 1898, many people had come to the conclusion that consumption in man was mainly dependent on the lower animals, *i.e.*, man became tuberculous through eating flesh and drinking milk, while stockowners lost 30 per cent. of their cattle from the disease.

No attempt to deal efficiently with tuberculosis in the lower animals is likely to succeed without the co-operation of stockowners. This is most likely to be enlisted if it be shown that success in the attempt will prove beneficial to those whose pecuniary interest is at stake. They must first be convinced that tuberculosis is the cause of loss, and loss of such a magnitude that it is worthy the effort. The prevalence of the disease in cattle is beyond dispute. Its insidious nature and usually slow course may obscure the parity of the inroads it makes on their resources, but all who have brought to bear an enlightened experience on the consideration of the matter cannot fail to know that tuberculosis is a source of very great loss to stockowners. In a certain proportion of cases the disease in cattle proves fatal; in a very much larger proportion it would do so if its subjects were not slaughtered to avert the natural occurrence and to provide food for man. With dairy and breeding cattle length of productive life is of the utmost importance. Tuberculosis often renders animals unsatisfactory for breeding and dairying, and necessitates early removal and disposal at a sacrifice and at a risk. When

an animal before death is so seriously affected as to render its retention in the dairy or breeding herd undesirable, its preparation for the butcher is a costly and often unsuccessful proceeding. An appreciably tuberculous animal is a menace to its fellows, and inconvenience, disappointment, and great monetary loss are accompaniments of the affection. Out of every 100 cows in Great Britain, I think it would be safe to compute that two or three have to be disposed of annually as "bad doers," etc., being proved to be tuberculous. In some herds the percentage is much higher, and with those who strongly advocate the voluntary methods of ridding our herds of the pest I heartily agree; notwithstanding all the cost and trouble which they entail, they will prove in the end economical. In considering the loss to stockowners from tuberculosis, its general distribution and its palpably serious incidence, in some instances the cost to the country is probably much greater than that of some of the scheduled contagious diseases of animals with which the State Department has successfully dealt at greater or lesser expense. The advantage to the stockowner from an economical point of view to have his herds free from tuberculosis would be a real and material aid, and any State assistance in bringing this about would render a true service in relief of some of the burdens which now crush down the agriculturist. In the improvement of the health of the stock of the country lies the great hope of the Board of Agriculture for recovering the industry it is formed to care for. There is now practically agreement on the main questions regarding measures for the eradication of tuberculosis from the lower animals. Its contagious nature is accepted. Heredity, if it has any influence, is only allowed to play an insignificant part. The tuberculous animal is the danger to the healthy animal, and that danger can only be removed by disposal of the tuberculous animal, the seed bed of the germs; for while the majority of tuberculous animals do not throw off tubercule germs, there are no means of determining when they may do so and become dangerous to their fellows. In insisting on the importance of removing the affected animal, we do not under-rate the value of providing the best hygienic conditions in shape of pure air, cleanliness, sunlight, etc., which would materially aid in the elimination of the disease by lessening the chances of infection. The corollary of this subject, however, should afford the strongest incentive to ridding animals of tuberculosis. Tuberculous lower animals of every species, which come into contact with man, but especially those which supply his food, are manufacturers of the germ of a disease which menaces human life and causes one-tenth of the human mortality in Great Britain. It must not be inferred from this that the sum of human mortality is mainly due to germs discharged by the lower animals. Tuberculous man is undoubtedly the great danger to man. The number of cases of tuberculosis in the human subject which owe their origin to the cow has probably been overestimated, but that a certain and no inconsiderable portion is dependent on the entrance into the human body of germs discharged by affected animals is beyond question, and we know that any plans adopted for eradicating tuberculosis in man, unless the danger connected with the lower animals is removed, are useless. It may scarcely be within our province as veterinarians to attempt to define the degree of danger to man, though, as students of comparative pathology, concerned in educating public opinion, we are bound to render every possible assistance in arriving at sound knowledge and just conclusions.

The relation of tuberculosis in the lower animals to tuberculosis in man rests first and foremost on the fact that the cause of the disease in man and animals is identical. If in the ordinary course of events the tubercle bacillus of which the affected animal is the seed bed are liable to be taken into the system of man, there is danger of his contracting the disease. It is beyond

all question that the edible portions of an affected animal may contain the bacilli, and that under some circumstances the germs pass out with the milk. Whoever consumes such meat and milk containing the living germs must be in danger of contracting tuberculosis. In short, tuberculosis is a contagious disease communicable from animals to man and *vice versa*, and because of the liability to consume the germs in meat and milk it is a distinct menace to human health and life.

The element of contagiousness of the disease we recognise as of extreme importance, and whatever may in the slightest degree tend to obscure this view, if allowed to guide public opinion, must retard the movement we suggest for removal of the danger. Accept the position that tuberculosis in men and animals is a contagious disease, and that we are in a position to detect its existence in the living animal, and to prevent distribution of the germs, and we may conclude that it is also preventable. As far as cattle and that portion of man's tuberculosis derived from them is concerned we certainly accept the position. Yet the paramount importance of the element of contagion would from some very recent pronouncements appear not to be universally accepted. Some of these come from those whose positions are entitled to our respect, certain to carry great weight and to proportionately delay effective action in dealing with this terrible scourge ; and, in commenting on these utterances as a student of comparative pathology, I do so with the greatest deference to their exalted position and great experience in recognition of their impossibility for the health of man.

In his opening address, as President of the Section of Medicine, at the last meeting of the British Medical Association, Sir Richard Douglas Powell is reported to have said concerning tuberculosis, that "we must not discontinue to attach due importance to the other etiological factors, because one of them may seem, *primâ facie*, to be sufficient. To set heredity at naught, to regard climatic considerations as of no importance, and to state that the disease is always acquired by direct contagion or infection, is, in my opinion, to ignore much that is true, and to magnify that which should be safeguarded from exaggeration." "We are all familiar with circumstances connected with the incidence of certain cases of tuberculosis, which render it probable that they may have been acquired by indirect contagion and through the contaminated dust of dirty rooms, and know that under certain conditions of stagnant and dark surroundings, a patient with advanced phthisis, of unclean habits, would cause local danger of tuberculous infection to his attendants and friends and future occupants of the room. But except under such and similar experimental conditions, the evidence of the contagiousness of phthisis is extremely slender." "While, therefore, on the one hand, advising every ordinary measure of cleanliness, avoidance of dust and proper disposal and disinfection of sputum, we may almost avoid all exaggerated statements calculated to alarm the public as to the contagion of phthisis." "Pulmonary consumption is comparatively rare before puberty, infantile mortality being almost exclusively from bowel consumption through milk infection."

I do not suggest that hereditary or climatic conditions, or indeed any other long-prevailing view, should be set at naught until disproved. They should all be considered on their own merits. I do not know that certain states of system may not be more favourable to the inception and development of tuberculosis. I do not deny that a child or a calf may, in some instances, inherit the actual bacillus and the toxin. I believe that whatever the element is, it may be acquired as well as inherited, but we may safely affirm that, whatever the condition may be, whether inherited or acquired, without the bacillus there will be no tuberculosis in animal or man. The child, calf, or other animal whose parents are tuberculous certainly inherits greater risks

of acquiring the bacillus from parents and relatives, and becoming infected. There can be no doubt that tuberculosis runs in families, and that insurance offices are fully justified in surcharging policies of individuals with a family history of consumption. Dr. Reginald Thompson's observations, referred to in the same speech, as to the progeny of tuberculous parents, need not be questioned; but being born and bred in close relation with tuberculous people certainly provides chances of infection, which cannot obtain without the *causa causans*. Observation and direct experiment on the lower animals tell us clearly enough that what is termed predisposition is, if extant, not sufficiently demonstrable. When cattle of various breeds, families, strains, and cross-bred co-habit, the incidence of tuberculosis yields no proof of such a tendency. Calves born of tuberculous cows removed to healthy situations at birth, and kept beyond possibility of infection, remain free from tuberculosis.

If the view be correct that the majority of affected men and animals could not have escaped tuberculosis except by not having been born, then I fear any material reduction in consumption cannot be looked for within a short period. Hereditary tendencies, as a rule, are not easily stamped out. The strong advice of the family physician will, I fear, not succeed in turning the course of natural affection, and prevent materially the marriage and intermarriage of those with family histories of consumption. Yet deductions from statistics presented to the last Royal Commission on Tuberculosis tell us that tuberculosis in human subjects beyond the milk-drinking age have undergone a most material reduction since the advent of improved sanitary surroundings, which I think it may be claimed are as likely to destroy and prevent access of tubercle bacilli as to eliminate hereditary tendencies. The outcome of our experience is that, if we endeavoured to eradicate tuberculosis from a breeding herd of cattle by crushing out the predisposition, we should utterly fail, while we know that, if we can prevent tubercle bacilli from entering the system of the calf after birth, the chances of its becoming tuberculous are 300 or 400 to 1, and the odd chance is an allowance for congenital disease. It is important in this connection to bear in mind that under conditions which usually obtain outside the animal body the tubercle bacillus does not multiply, and that the bacillus is not ubiquitous. That it is commonly distributed we must admit, but this depends on the general distribution of men and animals affected with tuberculosis.

The tuberculosis of man, which comes under our consideration to-day, is, at any rate in part, an acquired condition. Our attention must be directed to intercepting the cause, to preventing its access, and to providing the best conditions of life for the animal—sanitary surroundings, ventilation, properly constructed buildings, ample air space, etc.; but our experience tells us most emphatically, as far as cattle are concerned, that no surroundings which permit access of tubercle bacilli will eradicate tuberculosis. Except in situations where the tubercle bacilli have been discharged by animals affected with tuberculosis, there is no reason for believing that the germs of the disease exist in considerable numbers. Co-habitation with diseased animals is mainly accountable for the spread of the disease among cattle. We sometimes find tuberculosis in from 50 to 90 per cent. in so-called model cowsheds; at other times it is found to be entirely absent in cowsheds, devoid of almost every condition favourable to health, and we conclude that in the former case there are one or more animals providing the seed, without which the disease cannot exist, while in the latter case there is no such tuberculous animal.

The remarks as to phthisis—*i.e.*, tuberculosis of the lungs being rare in young children, while abdominal tuberculosis is common and traceable to milk infection—are strongly suggestive of the announcements made at the Harber Lectures of last year, which contained a terrible indictment against the

cow as a producer of consumption amongst infants and young children taking milk. With the scare due to expression of similar opinions grew the idea that tuberculosis of children nearly always affected the abdomen, and resulted from taking cows' milk. Several well accredited observers have, however, come forward with indisputable evidence which throws much doubt on the correctness of the statistics, refutes the inferences, and certainly does not support the assertion that tuberculosis of the lungs is rare before puberty. From the results of *post-mortem* examination of large numbers of tuberculous children, Drs. Stih, Guthrie, and Carr show that in a large majority of the cases of tuberculosis of young children the disease is found in the lungs, where it probably commenced, and a very much smaller proportion in the abdomen.

The revelations of the tuberculin test must have been far from agreeable news to stockowners: 30 per cent. of milk-yielding cows are tuberculous. The bold information that the mortality amongst children was almost entirely dependent on the consumption of cows' milk intensified the case against the lower animals, and created an impression based on unreliable observation or incorrect deductions from figures. At the present moment the position stands greatly modified. I venture to think it is much more secure as a basis for effective action. There is no appreciable diminution in the number of tuberculous cattle, and the real danger to man remains the same. The alarm and panic arising from erroneous and exaggerated statements have subsided. There is no longer a demand for immediate slaughter of every animal said by the tuberculin test to be affected, and for the confiscation and destruction of its carcase. It is pretty generally agreed that, except in rare cases, it is only when the udder of the cow is the seat of the disease that the milk contains tubercule bacilli and is dangerous to man or other animals. Careful observation and extended experience tell us that only a comparatively small proportion of cows which respond to the tuberculin test have tuberculosis of the udder. The proportion has been variously estimated, but because there is only a small percentage of dairy cows with affected udder we may not infer that the danger to man is to be gauged by an estimate of their supply, for unfortunately their milk becomes mixed with that from the other cows of the dairy, and so the area of mischief is enormously increased. The results of the examination of milk daily sold for human consumption made by Delépine, Kanthack, and many others, who have not only demonstrated the presence but also the fatal effects of the deadly germs, show clearly the danger connected with our ordinary milk supply. We incur an awful responsibility if we unduly minimise the danger of drinking such milk. There can be no shadow of doubt that tubercule bacilli are constantly being purveyed with milk. The subjection of such milk to a high temperature short of boiling renders it safe as far as tuberculosis is concerned, and has the additional advantage of destroying other disease germs which the milk may possibly contain, but the public have a right to demand an article of commerce free from all such deadly germs. We dare not hope for the general adoption of this simple precaution. The story of Naaman and Jordan still represents the condition of the popular mind. This danger is recognised by the State, for, as we all know, the Local Government Board will grant to sanitary authorities who may apply to it power to exclude from dairies all cows affected with diseased udders. Some large corporations have obtained these powers. If these provisions are good for the larger communities, whose representatives are sufficently intelligent, careful, and energetic, to apply for the powers, surely they are good for every individual. The time is fast approaching when it will become a scandal and crying shame that no systematic legislative means are adopted for preventing that part of the terrible scourge tuberculosis, derived

from the lower animals, and the benefits of our present knowledge should affect every member of the community. The inspection of milk-supplying animals should be general, systematic, uniform. We may not all be of one mind as to the possibility of stamping out tuberculosis in cattle in a short space of time, but we cannot fail to agree that the time for decisive action has come. The elimination or diminution of tuberculosis in cattle would be a great economical advantage to the stockowner, while the loss he now experiences has been no more under his control than the price of wheat, and from the chances of cattle, etc., becoming infected by tuberculous man he has some special claim to our consideration. It would remove, or possibly modify, a menace to human health. There seems every reason why the State should aid the stockowner, and protect the public health from the ravages of this preventable disease. The number of appreciably dangerous animals is not so large that the attempt should be neglected on account of cost. The difficulty of removing at once all animals in advanced state of tuberculosis and those with diseased udders is not unsurmountable, and is a matter of extreme urgency. To maintain the advantage gained by this procedure a systematic inspection of all milch cows would be necessary. In view of papers to be discussed this afternoon, I must refrain from entering upon details concerning the carrying out of the measures. It is to be hoped that the outcome of this conference and this great congress will be to hasten the adoption of legislative and voluntary measures, which shall at least be a serious attempt to prevent tuberculosis in the lower animals, and its spread therefrom to human beings.

KARANSAS AGRICULTURAL EXPERIMENT STATION, JUNE, 1899.

The Relative Virulence for the Domestic Animals of Human and Bovine Tubercle.

BY ROBERT R. DINWIDDIE, M.D.

Part I.—Bibliographical Review.

By the terms human and bovine tubercle—tuberculosis as it occurs in man and in cattle—a division of convenience only is implied. Although tuberculosis occurs in other species of domestic animals than cattle, and even in wild animals under confinement, these cases are comparatively rare. In so far as contagion is concerned, it may be presumed that mankind and cattle constitute the essential agents in the perpetuation and spread of the disease. It is frequently said that one out of every seven persons die from tuberculosis. Autopsical records show a much larger percentage than this affected with tubercular lesions. Of the numbers who at some period of their lives suffer from some form of tubercular disease and ultimately recover, we have practically no knowledge.

Among cattle, though the mortality from this disease is small, the percentage showing tubercular lesions on slaughter, although far less uniform in geographical distribution, is in many countries and in certain regions of this country apparently little inferior to that in mankind. Compared with these figures, the occurrence of tuberculosis in horses, pigs, sheep, dogs, and cats, becomes insignificant. Moreover, in these animals the records seem to show in nearly all cases an extraneous infection—dogs and cats from mankind;

pigs from cattle. Human and bovine tuberculosis, on the contrary, possess some claim to a genealogical unity, each species receiving the contagion presumably from its own kind. This much may be assumed without prejudging the case, namely, that cattle in general receive the contagion of tuberculosis from each other rather than from mankind, in so far as the opportunities for infection in this way are decidedly greater. The history of cases of tuberculosis-infection in cattle, where these are available, points to the same conclusion: there are many observations on record of infection of herds by the introduction of diseased animals, but hardly any worthy of consideration which point to an infection from man. The assumption of a genealogical unity for bovine tuberculosis in general is therefore justifiable, although not necessarily correct in all cases.

In the case of tuberculosis in man such an assumption, based upon the degree of exposure, is less justifiable on account of the universal use of milk which may supply a source of contagion when derived from tuberculous cows. In other words, man is more exposed to the contagion of bovine tuberculosis than are cattle to that of human tuberculosis. Pathologists, however, are almost unanimous in the belief that in the human race the principal mode of infection is from man to man.

There is in these facts some foundation for an hypothesis of a division of mammalian tuberculosis into two varieties etiologically distinct, the human and the bovine; of an evolution of races of tubercle bacilli, each parasitic especially in its own host-species, but possessing little aptitude for growth in the other.

The intertransmission of tuberculosis between mankind and cattle must depend upon two factors, namely, first, the virulence of tubercle bacilli of bovine tuberculosis for man and of those of human tuberculosis for cattle; and second, the degree of exposure to contagion between the two species. The latter of these influences may be estimated by observation of our relations with cattle generally, and in relation to human infection has been made the subject of much research in the examination of meat and milk, but the former can be determined only by experimentation, an experimentation which, in this instance, is necessarily one-sided.

This question of the intertransmission of human and bovine tuberculosis possesses its greatest importance from the standpoint of hygiene. Is tuberculosis transmissible from cattle to man? If so, what proportion of our multiform tubercular ailments—phthisis, scrofula, arthritic disease, lupus, infantile diarrhœa, meningitis, etc., owe their origin to this source of infection? These questions remain for the future to answer.

From the agricultural standpoint we have to consider the opposite condition—namely, the possibility, and if this be shown, the relative frequency, of the transference of the disease from man to cattle. This side of the question has an importance of its own, independent of what light it may throw upon the question of the etiological unity or duality of the human and bovine disease. Although we have assumed that cattle in the great majority of cases acquire the contagion from their own kind rather than from man, because of their more intimate cohabitation with each other, there is the possibility that the starting point of a general infection of a herd may have a human source. If cattle are readily susceptible to the action of the bacilli of human pulmonary consumption the opportunities for contagion of this kind must be frequently supplied by consumptive dairy attendants. The dried and pulverised expectorations of consumptives, considered to be the chief source of infection in man, it is permissible to suppose, may be an occasional source of infection also in the cow stable. Since the eradication of tuberculosis from the cattle on a farm is usually an expensive process it

becomes important to learn as far as possible all the methods by which the disease may be introduced. Whether or not cattle do at times obtain infection from man is a question on which we have practically no knowledge. That they are to a certain degree exposed to the contagion of human tuberculosis is unquestionable; whether or not this exposure may result in infection is another question, and one on which the literature of tuberculosis throws but little light. We can hardly hope to obtain information on this point by ordinary observation in a disease so universal in its distribution, and so insidious in its attacks as tuberculosis. The fact that such observations are hardly at all recorded in tuberculosis literature has, therefore, but little value in disproving the possibility of an occasional human origin of bovine infection.

The prevalence of tuberculosis in cattle, as in mankind, is undoubtedly dependent upon several factors—contagion, mode of life, and inherited constitution, or predisposition, as it is generally expressed. Without discussing here the relative importance of each of these influences, the fact may be noted that, under the conditions in which cattle are commonly kept, contagion from one diseased animal will in time give rise to a general infection of the others on the same farm. This fact is not any longer in dispute. The influence of contagion in the spread of tuberculosis is, in fact, better supported by observation of the disease in cattle than it is in the same disease in man.

An inquiry into the probabilities of an infection of cattle from man should include a consideration of the degree or extent of the exposure to contagion, the mode or form in which the contagion is supplied, and the susceptibility of cattle towards such contagion, all compared with the conditions which prevail in infection from animal to animal. An exhaustive discussion of the two former of these considerations is outside the range of this paper. A brief statement, however, of the views generally held by pathologists may with advantage be given here.

There is much yet to be learned both in the human and bovine disease as to the modes by which contagion is effected and the gateway by which the bacilli gain entrance to the body. It is believed that in cattle, as in man, the bacilli are supplied chiefly by the discharges from the lungs, although in cattle such discharges are seldom abundant, and have not been found to contain tubercle bacilli in numbers such as are found in the expectorations of human consumptives. It is, indeed, as is well known, rare that a finding of tubercle bacilli can be made in such nasal discharges as are obtainable from cattle, although I have myself seen one case in which the bacilli were as numerous in the profuse nasal discharge as I have ever found them in human sputa. In this exceptional case, which shortly ended in death, a large tubercular abscess was found in the lung. It is probable that the bacilli are also discharged by the breath during coughing in the form of spray. Since most of the sputa in cattle seems to be swallowed, it can hardly be doubted that the bowel discharges of tuberculous cows act as carriers and distributors of tubercle bacilli. On purely theoretical grounds there is reason in thinking that this may really be the principal way in which stables are infected, but no actual investigation of this matter seems to have been made. That tubercle bacilli may traverse the alimentary tract without losing their pathogenic activity has been established by several investigators. The inhalation of the dried and pulverized discharges containing tubercle bacilli, or their introduction with the food, results in the primary infection of the respiratory or alimentary tract. This is the mode in which infection is supposed to be brought about. Prolonged or repeated exposure, such as occurs in the cohabitation of cattle in stables, seems to be necessary for infection in most cases, although

Chauveau has shown that a single feeding of calves with tubercular material may be sufficient.

The conditions of a problematical infection of cattle from human consumptives are not different from those above described, except in degree. The dispositions of tuberculous human sputa on the floor of the cow stable are in this case comparatively infrequent, but the number of bacilli contained in the sputa usually very large as compared with those present in similar discharges from cattle. In both instances the bacilli are distributed in the same form, namely, in the morbid excretions of diseased lungs. On the whole it would seem that the amount of contagion supplied in this way may be sufficient to occasionally initiate tuberculosis in a herd of closely stabled dairy cows, assuming that the susceptibility of cattle is equally great for tubercle bacilli of human and of bovine origin. We can hardly be justified in assuming that this is the case without experimental evidence. The fact that bacilli of the same species (so far as our knowledge of species among the bacteria will allow us to judge) are present as casual agents in the lesions of human and bovine tuberculosis does not necessarily imply an absolute etiological identity of those diseases. It is conceivable that human and bovine tubercle bacilli may represent races of the same species differing from each other in their pathogenic activity, the one parasitic and pathogenic especially in man, the other in cattle.

It would seem that amidst the multitude of inoculation and other experiments in the artificial production of tuberculosis which have been made since the time of Villemin, sufficient evidence would be available to enable us to judge of this question. I have taken the pains to wade through the literature of tuberculosis, a library in itself, in order to glean from the record of these experiments whatever seemed to have any bearing on this subject, and here present, as a prelude to certain experiments of my own in this line, a brief review of what seemed to me to be the most important. It may be said, in the first place, that but few experiments have been made with the object of testing the relative virulence of human and bovine tubercle towards the larger domestic animals. Most of the inoculation or feeding experiments prior to Koch's discovery of tubercle bacilli, published in 1882, were made with the view of testing the specific or contagious nature of tubercle in general. In most cases the infective material was obtained either from mankind or from cattle. In some few the records fail to show from what source it was obtained.

(*To be continued.*)

Communications, Books, Journals, etc., Received.

Veterinarian; Record; Bulletin of The John Hopkins Hospital; The Journal of Comparative Medicine and Veterinary Archives; The Scottish Medical and Surgical Journal; American Veterinary Review; The Public Health Journal; The Journal of the Jamaica Agricultural Society; Queensland Agricultural Gazette; Petersburg Veterinary Society's Journal; Revista Veterinaria (Vitoria); La Riforma Veterinaria (Naples); Recueil de Médecine Vétérinaire (Alfort); L'Echo Vétérinaire (Liège); Annales de Médecine Vétérinaire (Brussels); Berliner Thierärztliche Wochenschrift (Berlin); Deutsche Thierärtzliche Wochenschrift (Hannover and Karlsruhe); La Clinica Veterinaria (Milan); La Revista Veterinaria (Buenos Aires); Agricultural Journal (Cape Town); Bulletin de la Société des Sciences (Bucarest).